

STIC Structure Search

Access DB# 108288

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: David Hayward Examiner #: 69619 Date: 11/14/03
Art Unit: 1712 Phone Number 308-2372 Serial Number: 101066455
Mail Box and Bldg/Room Location: CP3/05D35 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Phosphorus-containing flame-retardant hardeners

Inventors (please provide full names): Chun-Shan Wang, Jeng-Yueh Shieh, Ching Hsuan Lin

Earliest Priority Filing Date: Sept. 20, 2001

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please supply references to and CAS Reg. numbers for compounds meeting the structures of the last three hardeners, (G), (H), (I) of claim 1 (attached)

(Not much out there, so (C), (D), (E), and (F) were also done from same parent structure)

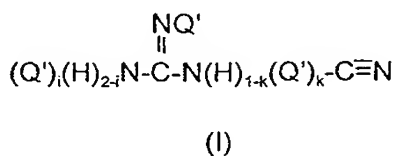
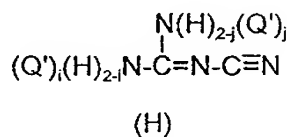
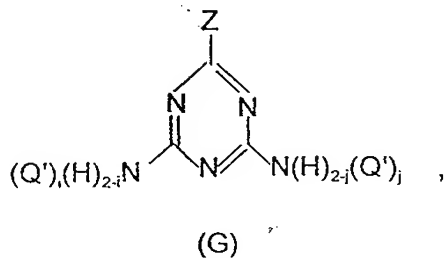
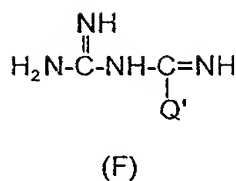
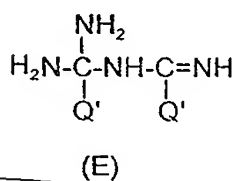
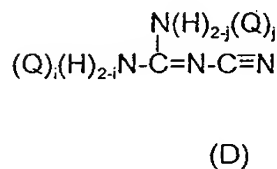
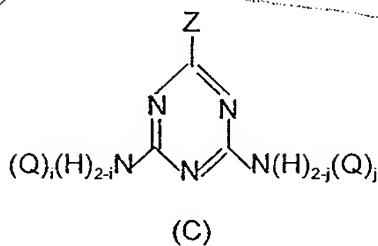
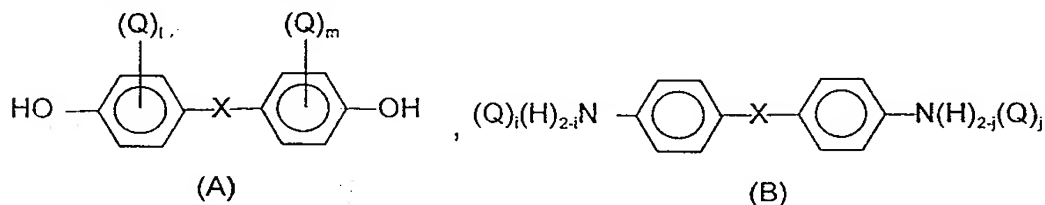
STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
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Searcher Phone #: _____	AA Sequence (#) _____	Dialog <u>(abstracts)</u>
Searcher Location: _____	Structure (#) <u>(8)</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr. Link _____
Date Completed: <u>11-14-03</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>5</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>80</u>	Other _____	Other (specify) _____

Qb 10/066455

10/066455

1. A phosphorus-containing flame-retardant hardener having a formula selecting from the group consisting of (A) to (I):

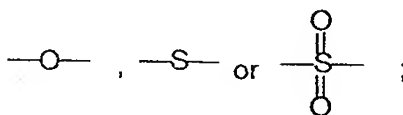
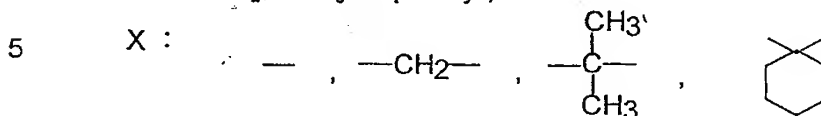


10066455.013002

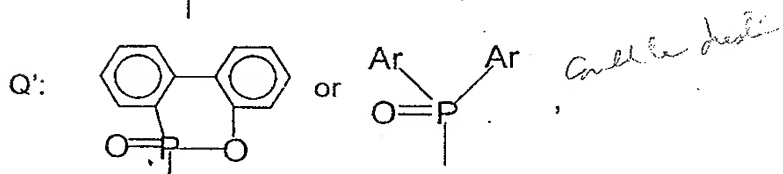
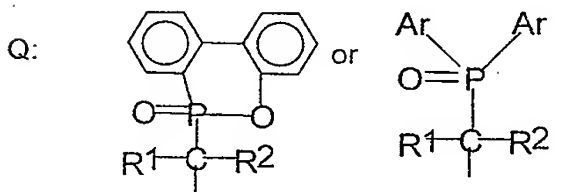
wherein

l and m independently are 0, 1 or 2, and $l + m > 0$; i and j independently are 0, 1 or 2, and $0 < i + j < 4$; k is 0 or 1, and $i + k < 3$;

Z is $-NH_2$, $-CH_3$ or phenyl;



10

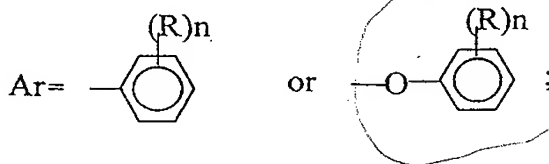


15

wherein

R^1 , R^2 independently are H, C1~C18 alkyl, C6~C18 aryl, C6~C18 substituted aryl, C6~C18 aryl methylene, or C6~C18 substituted aryl methylene;

20



wherein R is C1-C4 alkyl or C6-C18 aryl; and n is an integer of 0 to 5.

2. The hardener according to claim 1, wherein the hardener has the

NAME: Aylward

Serial Number: 101066455

STRUCTURE SEARCHING-ADDITIONAL FEATURES
(Answer as Appropriate)

1. Are there any elements or features that must appear in the structure? If so, is there a minimum, maximum or range?

Nitrogen 4-5
Phosphorous 1-4
Metals _____
Heterocyclic Rings 1-40
Carbocyclic Rings 2-8

Oxygen 1-8
Sulfur _____
Silicon _____
Halos _____
Other _____

2. Are there any elements or features you want to be excluded?

Nitrogen _____
Phosphorous _____
Metals _____
Heterocyclic Rings _____
Carbocyclic Rings _____
Polymers _____

Oxygen _____
Sulfur _____
Silicon _____
Halos _____
Other _____

Multi-components (i.e. salts, mixtures, complexes) _____

3. Can the shown rings have additional (yes or no)

fusion? _____ bridging? _____ spiro? _____

-OR-

are the rings isolated? yes

4. Are you looking for an elected species? 3
or for the generic structure? _____

5. Do you want the search broadened if no structures are found? No

6. If we get more than 15 structures, please do the following:
- _____ contact examiner
 - ✓ combine with the following utility reaction with epoxides
 - _____ limit to references with a date no later than 19__
 - _____ exclude applicant's references/work
 - _____ further limit the structure

7. What is the applicant's name? listed on search request form

8. Please attach the relevant claims with structure. ~~attach to the structure~~

9. If known, please describe and/or highlight the point of novelty or any extraordinary features on the structure. fine retardancy of hardeners

10. Do you want the results on disk? No You will need STN Express to read the results on disk.

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USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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=> d his

L1 FILE 'LREGISTRY' ENTERED AT 15:23:20 ON 14 NOV 2003
STR

L2 FILE 'REGISTRY' ENTERED AT 15:39:22 ON 14 NOV 2003
L3 SCR 1686
0 S L1 AND L2

L4 FILE 'LREGISTRY' ENTERED AT 15:43:49 ON 14 NOV 2003
STR L1

L5 FILE 'REGISTRY' ENTERED AT 15:48:51 ON 14 NOV 2003
L6 SCR 1686 OR 1533
L7 4 S L4 AND L5
52 S L4 AND L5 FUL
SAV L7 AYL455/A

L8 FILE 'CAOLD' ENTERED AT 15:50:25 ON 14 NOV 2003
2 S L7

L9 FILE 'ZCAPLUS' ENTERED AT 15:50:31 ON 14 NOV 2003
18 S L7

L10 FILE 'REGISTRY' ENTERED AT 15:50:46 ON 14 NOV 2003
L11 0 S L1 AND L2 SSS SAM SUB=L7
19 S L1 AND L2 SSS FUL SUB=L7

L12 FILE 'CAOLD' ENTERED AT 15:52:33 ON 14 NOV 2003
2 S L11

L13 FILE 'ZCAPLUS' ENTERED AT 15:53:01 ON 14 NOV 2003
7 S L11

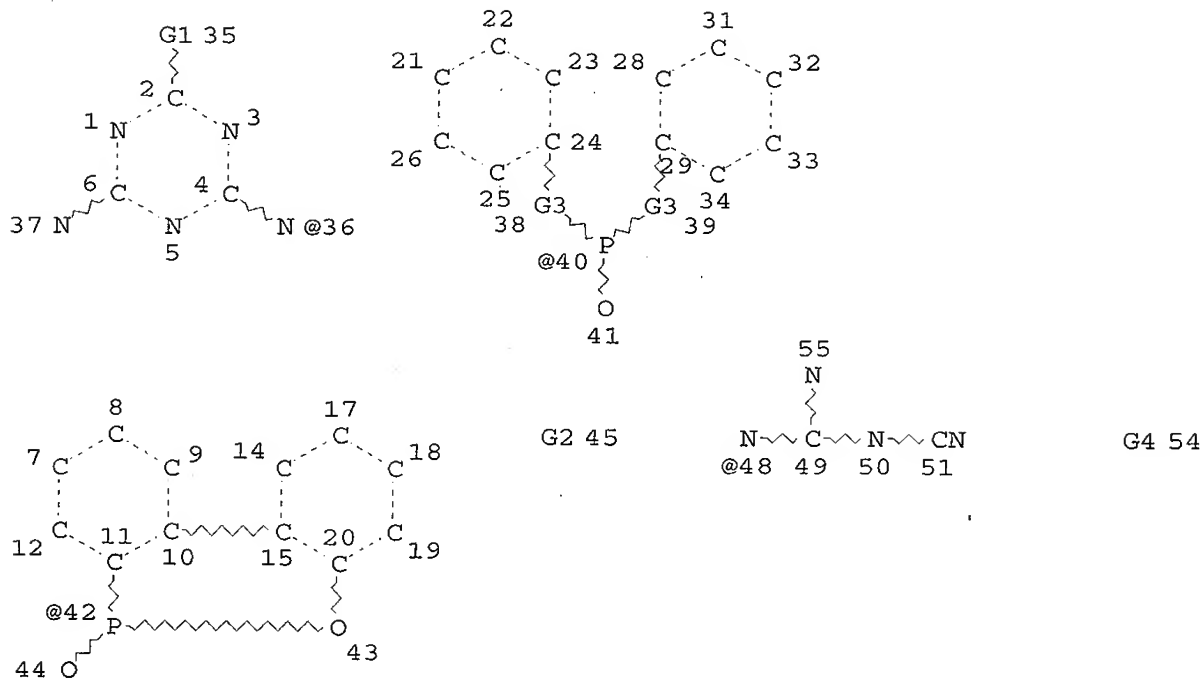
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33 S L7 NOT L11

L15 FILE 'CAOLD' ENTERED AT 15:53:23 ON 14 NOV 2003
1 S L14

L16 FILE 'ZCAPLUS' ENTERED AT 15:53:40 ON 14 NOV 2003
13 S L14

FILE 'REGISTRY' ENTERED AT 15:59:37 ON 14 NOV 2003

=> d l11 que stat
L1 STR



VAR G1=NH2/PH/ME/ET/N-PR/I-PR/N-BU/I-BU/S-BU/T-BU

VAR G2=36/48

REP G3=(0-1) O

VAR G4=40/42

NODE ATTRIBUTES:

CONNECT IS M2 RC AT 37

CONNECT IS E1 RC AT 41

CONNECT IS E1 RC AT 44

CONNECT IS M2 RC AT 55

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

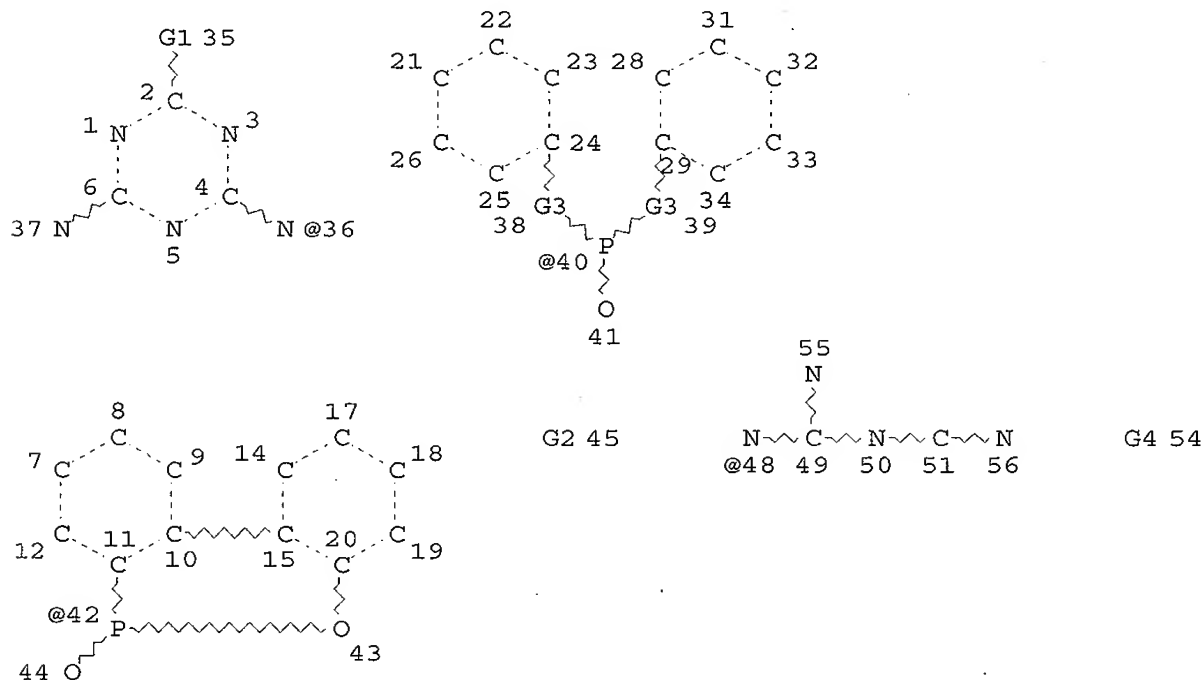
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NUMBER OF NODES IS 47

STEREO ATTRIBUTES: NONE

L2 SCR 1686

L4 STR



VAR G1=NH2/PH/ME/ET/N-PR/I-PR/N-BU/I-BU/S-BU/T-BU

VAR G2=36/48

REP G3=(0-1) O

VAR G4=40/42

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 48

STEREO ATTRIBUTES: NONE

L5 SCR 1686 OR 1533

L7 52 SEA FILE=REGISTRY SSS FUL L4 AND L5

L11 19 SEA FILE=REGISTRY SUB=L7 SSS FUL L1 AND L2

100.0% PROCESSED 19 ITERATIONS

19 ANSWERS

SEARCH TIME: 00.00.01

=> file caold

FILE 'CAOLD' ENTERED AT 15:59:50 ON 14 NOV 2003

FILE COVERS 1907-1966
FILE LAST UPDATED: 01 May 1997 (19970501/UP)

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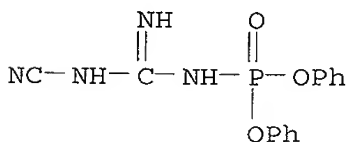
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L12  ANSWER 1 OF 2  CAOLD  COPYRIGHT 2003 ACS on STN
AN   CA59:1509a  CAOLD
TI   interaction of phenyl isocyanate and related compds. with Na
      borohydride
AU   Ellzey, Samuel E., Jr.; Mack, C. H.
IT   1785-02-0    1785-03-1    4623-21-6    6993-24-4    10311-59-8
      19287-71-9    26794-36-5    92148-97-5    93865-74-8    97196-69-5
      98176-06-8    98176-07-9    98252-37-0
      98766-64-4    98766-65-5    101837-33-6
IT   98176-06-8    98176-07-9    98252-37-0
      98766-64-4    98766-65-5
RN   98176-06-8  CAOLD
CN   Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
      propylamine (7CI)  (CA INDEX NAME)

      CM      1

      CRN      92193-47-0
      CMF      C14 H13 N4 O3 P

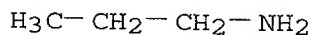
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CM 2

CRN 107-10-8

CMF C3 H9 N

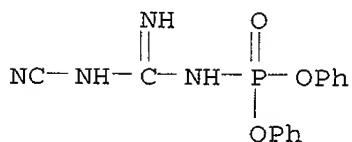


RN	98176-07-9	CAOLD	
CN	Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with isopropylamine (7CI)	(CA INDEX NAME)	

CM 1

CRN 92193-47-0

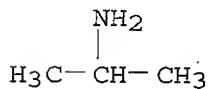
CMF C14 H13 N4 O3 P



CM 2

CRN 75-31-0

CMF C3 H9 N



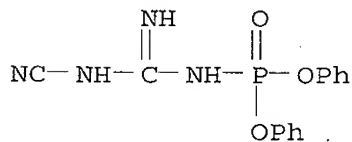
RN 98252-37-0 CAOLD

CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with EtNH₂ (7CI) (CA INDEX NAME)

CM 1

CRN 92193-47-0

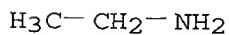
CMF C14 H13 N4 O3 P



CM 2

CRN 75-04-7

CMF C2 H7 N

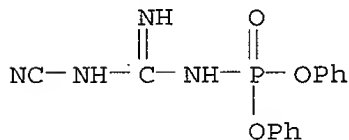


RN 98766-64-4 CAOLD
CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
BuNH₂ (7CI) (CA INDEX NAME)

CM 1

CRN 92193-47-0

CMF C14 H13 N4 O3 P



CM 2

CRN 109-73-9

CMF C4 H11 N

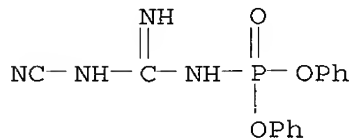


RN 98766-65-5 CAOLD
CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
iso-BuNH₂ (7CI) (CA INDEX NAME)

CM 1

CRN 92193-47-0

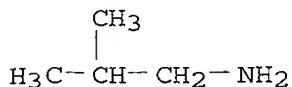
CMF C14 H13 N4 O3 P



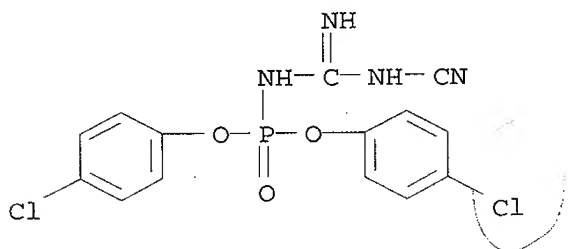
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CRN 78-81-9

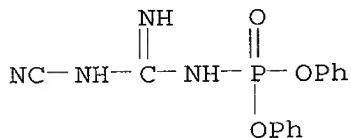
CMF C4 H11 N



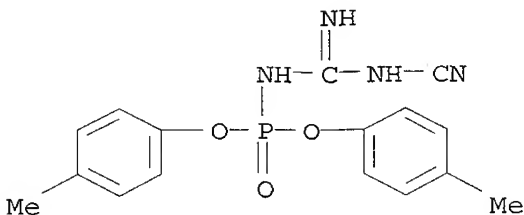
L12 ANSWER 2 OF 2 CAOLD COPYRIGHT 2003 ACS on STN
 AN CA59:1508h CAOLD
 TI acylation of dicyanodiamide with diaryl phosphoryl- and
 thiophosphoryl chloride
 AU Beyer, Hans; Pyl, T.; Lemke, H.
 IT 92103-60-1 92106-44-0 92193-46-9 92193-47-0
 93312-43-7 93312-44-8
 IT 92106-44-0 92193-47-0 93312-44-8
 RN 92106-44-0 CAOLD
 CN Phosphoramidic acid, (cyanoamidino)-, bis(p-chlorophenyl) ester
 (7CI) (CA INDEX NAME)



RN 92193-47-0 CAOLD
 CN Phosphoramidic acid, [(cyanoamino)iminomethyl]-, diphenyl ester
 (9CI) (CA INDEX NAME)



RN 93312-44-8 CAOLD
 CN Phosphoramidic acid, (cyanoamidino)-, di-p-tolyl ester (7CI) (CA
 INDEX NAME)



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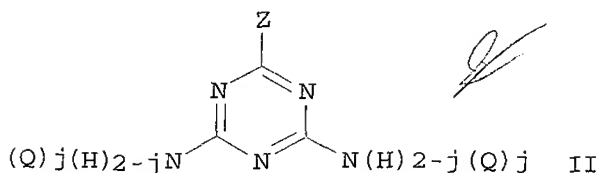
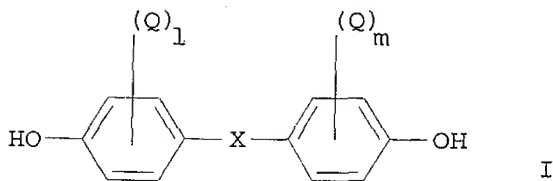
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L13 ANSWER 1 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN

2003:274797 Document No. 138:288481 Phosphorus-containing
fire-resistant curing agents and epoxy resins, advanced epoxy
resins, and cured epoxy resins containing them. Wang, Chun Shan;
Hsieh, Cheng Yueh; Lin, Ching Yuan (Taiwan). Jpn. Kokai Tokkyo Koho
JP 2003105058 A2 20030409, 29 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2001-386377 20011219. PRIORITY: TW 2001-90123251
20010920.

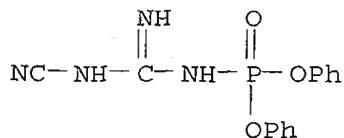
GI

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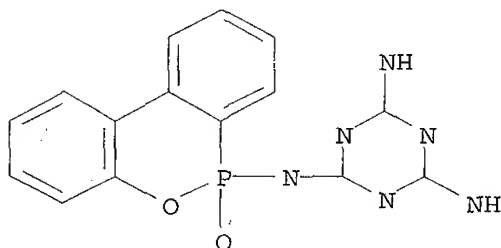


AB The curing agents are selected from I, $\text{NH}_2\text{-iQ}^i\text{C}_6\text{H}_4\text{-p-XC}_6\text{H}_4\text{-p-NH}_2\text{-jQ}^j$, triazine derivs. II, $\text{N.tplbond.CN:C(NH}_2\text{-jQ}^j\text{)NH}_2\text{-iQ}^i$, $\text{Q}^i\text{C(NH}_2\text{)}_2\text{NHC(Q}^i\text{):NH}$, $\text{H}_2\text{NC(:NH)NHC(Q}^i\text{):NH}$, and $\text{N.tplbond.CNH1-kQ}^k\text{C(:NQ}^i\text{)NH}_2\text{-iQ}^i$ [1, m, i, j = 0-2; 1 + m > 0; 0 < i + j < 4; k = 0-1; i + k < 3; Z = NH_2 , Me, Ph; X = direct link, CH_2 , CMe₂, cyclohexylidene, O, S, SO₂; Q = Q'CR₁R₂, Q'; Q' = 6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl, Ar₂P(O); R₁, R₂ = H, C1-18 alkyl, C6-18 (un)substituted aryl, C6-18 (un)substituted arylmethylene; Ar = C1-4 alkyl- or C6-18 aryl-(un)substituted Ph or phenoxy]. Epoxy resins contg. the curing agents are useful for semiconductor device packaging. Thus, bisphenol A was reacted with equimolar (6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methanol in the presence of AcOK to give [(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]bisphenol A, 228 g of which was treated with 564 g bisphenol A diglycidyl ether at 160.degree. for 2 h in the presence of EtPPH₃Cl to give an epoxy resin. The epoxy resin was cured with a novolak to show 5% wt. loss temp. 387.degree. in air and N and good fire resistance.

IT 92193-47-0P 507264-76-8P 507264-78-0P
(phosphorus-contg. fire-resistant curing agents for epoxy resins)
RN 92193-47-0 ZCAPLUS
CN Phosphoramidic acid, [(cyanoamino)iminomethyl]-, diphenyl ester
(9CI) (CA INDEX NAME)

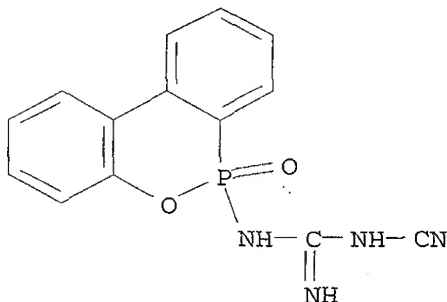


RN 507264-76-8 ZCAPLUS
CN 1,3,5-Triazine-2,4,6-triamine, N-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)- (9CI) (CA INDEX NAME)



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

RN 507264-78-0 ZCAPLUS
CN Guanidine, N-cyano-N'-(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)- (9CI) (CA INDEX NAME)



IT 92193-47-0P 507264-76-8P 507264-78-0P
(phosphorus-contg. fire-resistant curing agents for epoxy resins)

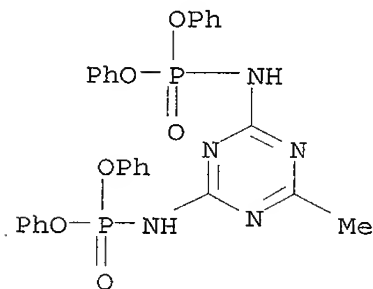
L13 ANSWER 2 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN
2001:932557 Document No. 136:54631 Halogen-free epoxy resin
compositions fireproofed by phosphoric amides. Saito, Seiichi;
Mori, Takahiro (Asahi Denka Kogyo K. K., Japan). Jpn. Kokai Tokkyo
Koho JP 2001354836 A2 20011225, 16 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2000-177676 20000614.

GI

Jan 2001 Patent literature

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

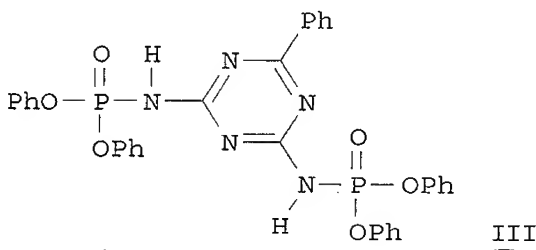
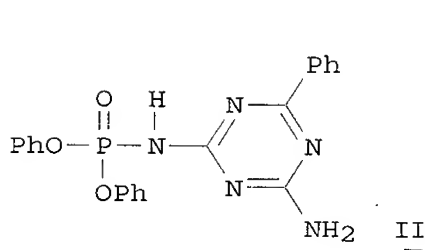
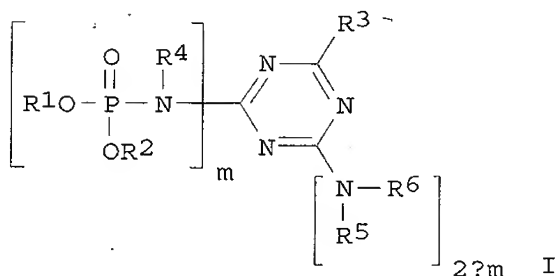
- AB The compns., possessing high Tg and offering moldings with high mech. strength, contain phosphoric amides represented by (i) I [A, B = R1R2R3C6H2 (R1-3 = H, OH, hydroxycarbonyl, C1-5 alkyl) or o-phenylene, Q1, Q2, or Q3 (R4 = C1-4 alkylidene) as combined form; X = O, S; m = 0, 1; n = 1-3; R = 1-3-primary amino-bearing group excluding melamine], (ii) (R1R2R3C6H2O)2P(:O)NHR5C6H4(ZC6H4)1R6NHP(:O)(OC6H2R1R2R3)2 (R1-3 = the same definition as above; R5, R6 = single bond, C1-4 alkylene; Z = single bond, O, S, sulfonyl, ester, amide, C1-4 alkylidene, condensed ring; l = 0, 1), or (iii) Q2P(:O)NHCH2C6H4CH2NHP(:O)Q2 (Q = phenoxy). The compns. further contg. silica, rubber, and novolak-type hardeners are also claimed. The compns. are useful for prepreps. Thus, a compn. of bisphenol A epoxy resin 40, carboxylated NBR-bisphenol A diglycidyl ether adduct 20, 2,2-bis(3,4-epoxycyclohexyl)propane 40, II 40, XLC-LL (benzene-formaldehyde-phenol condensate) 18.8, PR 53194 (phenolic novolak) 18.8, ethylene glycol Bu ether acetate 80, 2E4MZ 3.5 parts offered a cured product showing Tg 179.degree., tensile strength 85 MPa, elongation 13%, and UL 94 fire resistance rating V0.
- IT 382596-17-0
(fireproofing agents; phosphoric amide-fireproofed halogen-free epoxy resin compns. showing good mech. strength)
- RN 382596-17-0 ZCAPLUS
- CN Phosphoramidic acid, (6-methyl-1,3,5-triazine-2,4-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)



- IT 382596-17-0
(fireproofing agents; phosphoric amide-fireproofed halogen-free epoxy resin compns. showing good mech. strength)

L13 ANSWER 3 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN
2000:866431 Document No. 134:42922 Nitrogen-containing organic phosphorus compounds for fire-resistant resin composition. Teramoto, Makoto; Ohnishi, Hideaki; Hotta, Hiroshi (Daiichi Kogyo Seiyaku Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000344788 A2 20001212, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-155436 19990602.

GI



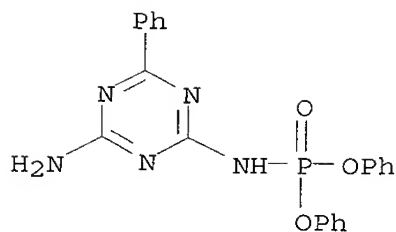
AB Title org. phosphorus compds. have general structure I [$m = 1, 2$; $\text{R}^1\text{-}3 = \text{C}1\text{-}10$ alkyl, alkenyl, cycloalkyl, (alkyl)phenyl; $\text{R}^4\text{-}6 = \text{H}$, $\text{C}1\text{-}10$ alkyl, alkenyl, cycloalkyl] and are useful as fire retardants in resin compns. Thus di-Ph chlorophosphate 53.7 g and benzoguanamine 18.7 g were reacted to give a 39:61 mixt. of compd. II and III. To a epoxy resin compn. comprising 89 parts of Epikote 828 and 11 parts of curing agent diethylenetriamine 15 parts of the above mixt. was added; the compn. was then degassed, heated, and heat-pressed to give a test plate which had oxygen index 32.0, V-0 in UL94 burning test, and <0.1 wt.% of fire retardant bleeding after placing in 80.degree. water for two days.

IT 312593-35-4P 312593-36-5P 312593-37-6P
312593-38-7P 312593-39-8P 312593-40-1P

(nitrogen-contg. org. phosphorus compds. for fire-resistant resin compn.)

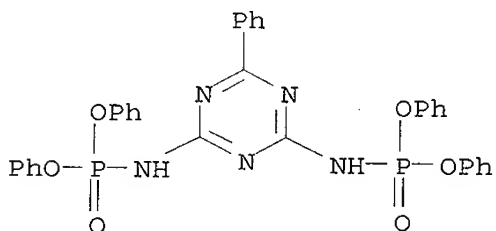
RN 312593-35-4 ZCAPLUS

CN Phosphoramidic acid, (4-amino-6-phenyl-1,3,5-triazin-2-yl)-, diphenyl ester (9CI) (CA INDEX NAME)



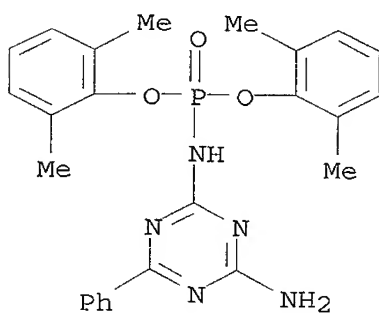
RN 312593-36-5 ZCAPLUS

CN Phosphoramidic acid, (6-phenyl-1,3,5-triazine-2,4-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)



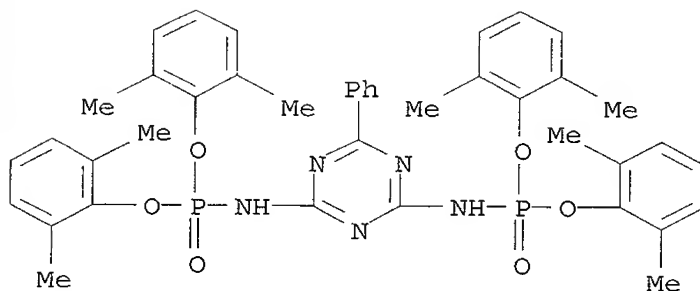
RN 312593-37-6 ZCAPLUS

CN Phosphoramidic acid, (4-amino-6-phenyl-1,3,5-triazine-2-yl)-, bis(2,6-dimethylphenyl) ester (9CI) (CA INDEX NAME)



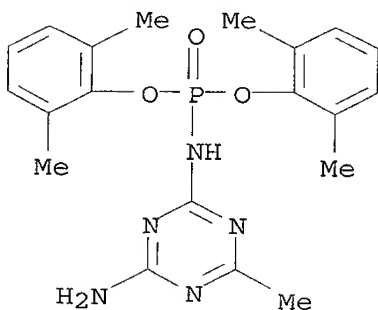
RN 312593-38-7 ZCAPLUS

CN Phosphoramidic acid, (6-phenyl-1,3,5-triazine-2,4-diyl)bis-, tetrakis(2,6-dimethylphenyl) ester (9CI) (CA INDEX NAME)



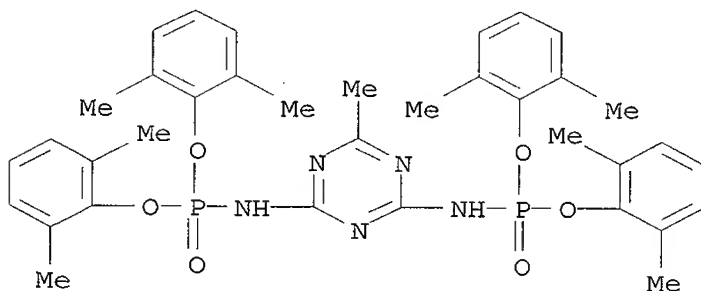
RN 312593-39-8 ZCAPLUS

CN Phosphoramidic acid, (4-amino-6-methyl-1,3,5-triazin-2-yl)-, bis(2,6-dimethylphenyl) ester (9CI) (CA INDEX NAME)



RN 312593-40-1 ZCAPLUS

CN Phosphoramidic acid, (6-methyl-1,3,5-triazine-2,4-diyl)bis-, tetrakis(2,6-dimethylphenyl) ester (9CI) (CA INDEX NAME)

IT 312593-35-4P 312593-36-5P 312593-37-6P
312593-38-7P 312593-39-8P 312593-40-1P

(nitrogen-contg. org. phosphorus compds. for fire-resistant resin compn.)

L13 ANSWER 4 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN

2000:36588 Document No. 132:51113 Nitrogen-containing phosphate fire retardants for poly(ethylene terephthalate) fiber fabrics and their preparation. Cho, Wan; Cho, Yongsik; Seo, Wooman (Guk, Inyoung, S. Korea). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1155601 A 19970730, 8 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 1996-122640 19961022.

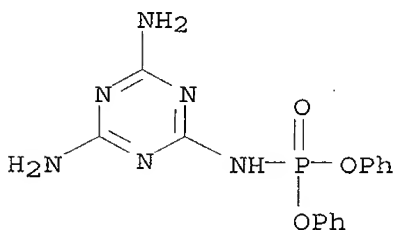
AB The fire retardants, useful for PET fabrics with good fire resistance and durability, are N-contg. phosphoric acid esters (R1)2P(O)R2 or R1OP(O)(R2)R3 [R1 = alkyl, allyl, or phenyl; R2, R3 = amino, melamine group, -NHCONH2, -NHCOOR1, -NH(CH2)nNH2, and -NH-p-C6H4NH2]. The fire retardant is prepd. by reacting a halogen-contg. phosphoric acid ester with a N-contg. compd. selected from urea, melamine, aminoformate, amine, diamine, or aryldiamine in an inert gas atm.

IT 252989-30-3P

(starting material; prepn. of nitrogen-contg. phosphate fire retardants for poly(ethylene terephthalate) fiber fabrics)

RN 252989-30-3 ZCAPLUS

CN Phosphoramidic acid, (4,6-diamino-1,3,5-triazin-2-yl)-, diphenyl ester (9CI) (CA INDEX NAME)



IT 252989-30-3P

(starting material; prepn. of nitrogen-contg. phosphate fire retardants for poly(ethylene terephthalate) fiber fabrics)

L13 ANSWER 5 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN

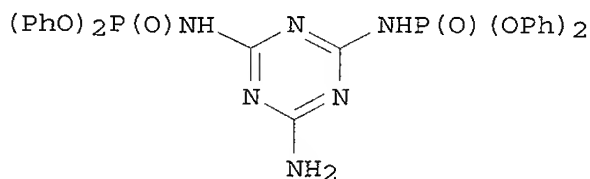
1996:197034 Document No. 124:343664 Preparation of nitrogen-containing organophosphorous compounds as flame retardants for polymers.

Matsubara, Kazuhiro; Katsumata, Tsutomu (Asahi Chemical Ind, Japan).

Jpn. Kokai Tokkyo Koho JP 08012692 A2 19960116 Heisei, 4 pp.

(Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-141567 19940623.

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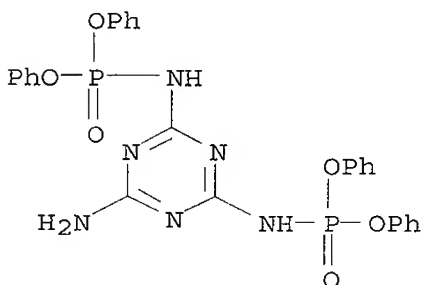
AB [R1OP(O)(OR2)NH]mR(NH2)n (m = 1-3; n = 0-2; m + n = 3; R1-2 = C1-10 alkyl, alkenyl, cycloalkyl, Ph, alkyl-substituted Ph; R = triazine ring) are prepd. by dehydrohalogenation of R1OP(O)(OR2)X (II; X = halo) with melamine (III). A mixt. of 135 g II (R1 = R2 = Ph; X = Cl) and 63 g III was treated at 150.degree. for 2 h, followed by at 180.degree. for 2 h to give 128 g the title compd. I, which improved flame retardant of modified PPE resins.

IT 176499-85-7P

(prepn. of N-contg. organophosphate as flame retardant by dehydrohalogenation of halophosphate with melamine)

RN 176499-85-7 ZCAPLUS

CN Phosphoramidic acid, (6-amino-1,3,5-triazine-2,4-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)



IT 176499-85-7P

(prepn. of N-contg. organophosphate as flame retardant by dehydrohalogenation of halophosphate with melamine)

L13 ANSWER 6 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN

1963:408624 Document No. 59:8624 Original Reference No. 59:1509a-c Interaction of phenyl isocyanate and related compounds with sodium borohydride. Ellzey, S. E., Jr.; Mack, Charles H. (Southern Regional Res. Lab., New Orleans, LA). Journal of Organic Chemistry, 28, 1600-4 (Unavailable) 1963. CODEN: JOCEAH. ISSN: 0022-3263.

GI For diagram(s), see printed CA Issue.

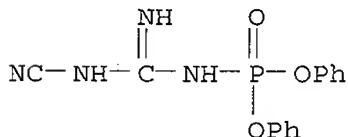
AB Catalytic trimerization of phenyl, p-tolyl, and p-methoxyphenyl isocyanates has been observed with several complex metal hydrides, with and without solvent. Excess NaBH4 in refluxing diglyme

IT 98252-37-0, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with EtNH2 98766-64-4, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with BuNH2 (prepn. of)

CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with EtNH2 (7CI) (CA INDEX NAME)

CRN 92193-47-0

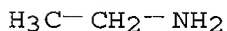
CMF C14 H13 N4 O3 P



CM 2

CRN 75-04-7

CMF C2 H7 N



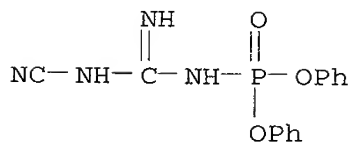
RN 98766-64-4 ZCAPLUS

CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
BuNH2 (7CI) (CA INDEX NAME)

CM 1

CRN 92193-47-0

CMF C14 H13 N4 O3 P



CM 2

CRN 109-73-9

CMF C4 H11 N



IT 98252-37-0, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with EtNH₂ 98766-64-4, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with BuNH₂ (prepn. of)

L13 ANSWER 7 OF 7 ZCAPLUS COPYRIGHT 2003 ACS on STN

1963:408623 Document No. 59:8623 Original Reference No.

59:1508g-h,1509a Acylation of dicyanodiamide with diaryl phosphoryl- and thio-phosphoryl chloride. Beyer, H.; Pyl, T.; Lemke, H. (Forschungsabt. VEB Stickstoffwerke, Piesteritz, Germany). Journal fuer Praktische Chemie (Leipzig), 16(No. 3-4), 132-6 (Unavailable) 1962. CODEN: JPCEAO. ISSN: 0021-8383.

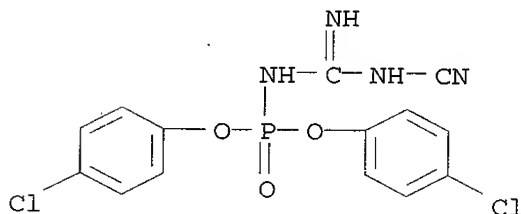
AB To a soln. of 8.4 g. dicyanodiamide in 50 ml. 4N NaOH and 50 ml. acetone was added, dropwise, a soln. of (PhO)₂P(O)Cl in a little acetone. During the addn., the temp. rose to 50.degree.. The mixt. was kept at 50.degree. for an addnl. 30 min. and then acidified with acetic acid to give 16 g. (60%) (PhO)₂P(O)NHC(:NH)NHCN (I), m. 177.degree.. Similarly were prepd. the p-tolyl analog of I, m. 199.degree., p-chlorophenyl ana-log of I, m. 177.degree., N1-diphenylthiophosphoryl-N3-cyanoguanidine (II), m. 168.degree., p-tolyl analog of II, m. 180.degree., and the p-chlorophenyl analog of II, m. 172.degree.. I was heated with HCl in MeOH to give (PhO)₂P(O)NHC(:NH)NHCONH₂, m. 206.degree.. Similarly, II gave the corresponding thiocarbamoylguanidine, m. 218.degree.. Upon heating I with monoalkylamines, (PhO)₂P(O)NHC(:NH)N-CN.RN+H₃ was obtained (R and m.p.): Et, 155.degree.; Pr, 155.degree.; iso-Pr, 133.degree.; Bu, 159.degree.; iso-Bu, 155.degree..

IT 92106-44-0, Phosphoramidic acid, (cyanoamidino)-, bis(p-chlorophenyl) ester 92193-47-0, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester 93312-44-8, Phosphoramidic acid, (cyanoamidino)-, di-p-tolyl ester 98252-37-0, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with EtNH₂ 98766-64-4, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with BuNH₂ 98766-65-5,

Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
iso-BuNH₂
(prepn. of)

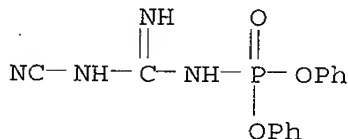
RN 92106-44-0 ZCAPLUS

CN Phosphoramidic acid, (cyanoamidino)-, bis(p-chlorophenyl) ester
(7CI) (CA INDEX NAME)



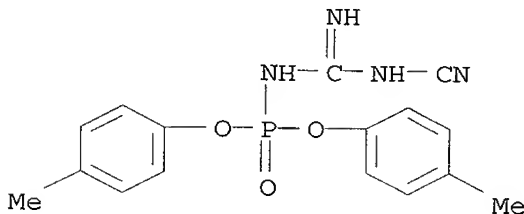
RN 92193-47-0 ZCAPLUS

CN Phosphoramidic acid, [(cyanoamino)iminomethyl]-, diphenyl ester
(9CI) (CA INDEX NAME)



RN 93312-44-8 ZCAPLUS

CN Phosphoramidic acid, (cyanoamidino)-, di-p-tolyl ester (7CI) (CA
INDEX NAME)



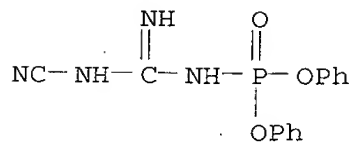
RN 98252-37-0 ZCAPLUS

CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
EtNH₂ (7CI) (CA INDEX NAME)

CM 1

CRN 92193-47-0

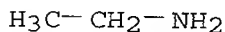
CMF C14 H13 N4 O3 P



CM 2

CRN 75-04-7

CMF C2 H7 N



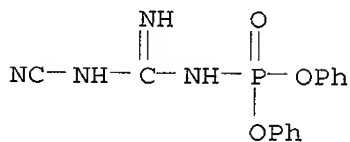
RN 98766-64-4 ZCAPLUS

CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
BuNH₂ (7CI) (CA INDEX NAME)

CM 1

CRN 92193-47-0

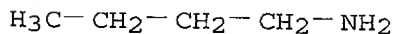
CMF C14 H13 N4 O3 P



CM 2

CRN 109-73-9

CMF C4 H11 N

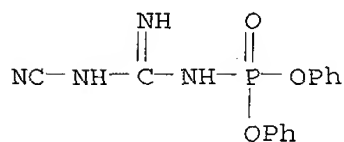


RN 98766-65-5 ZCAPLUS

CN Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with
iso-BuNH₂ (7CI) (CA INDEX NAME)

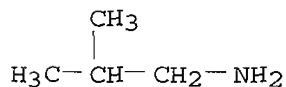
CM 1

CRN 92193-47-0
CMF C14 H13 N4 O3 P



CM 2

CRN 78-81-9
CMF C4 H11 N



IT 92106-44-0, Phosphoramidic acid, (cyanoamidino)-, bis(p-chlorophenyl) ester 92193-47-0, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester 93312-44-8, Phosphoramidic acid, (cyanoamidino)-, di-p-tolyl ester 98252-37-0, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with EtNH₂ 98766-64-4, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with BuNH₂ 98766-65-5, Phosphoramidic acid, (cyanoamidino)-, diphenyl ester, compd. with iso-BuNH₂ (prepn. of)

SDER p152

Aylward 10/066,455 (C), (D), (E), and (F)

Page 1

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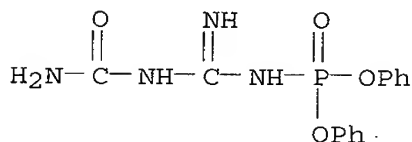
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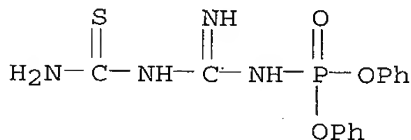
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L15 ANSWER 1 OF 1 CAOLD COPYRIGHT 2003 ACS on STN
AN CA59:1509a CAOLD
TI interaction of phenyl isocyanate and related compds. with Na
borohydride
AU Ellzey, Samuel E., Jr.; Mack, C. H.
IT 1785-02-0 1785-03-1 4623-21-6 6993-24-4 10311-59-8
19287-71-9 26794-36-5 92148-97-5 93865-74-8
97196-69-5 98176-06-8 98176-07-9 98252-37-0 98766-64-4
98766-65-5 101837-33-6
IT 93865-74-8 97196-69-5
RN 93865-74-8 CAOLD
CN Phosphoramidic acid, (carbamoylamidino)-, diphenyl ester (7CI) (CA
INDEX NAME)



RN 97196-69-5 CAOLD
CN Phosphoramidic acid, [(thiocarbamoyl)amidino]-, diphenyl ester (7CI)
(CA INDEX NAME)



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L16 ANSWER 1 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN

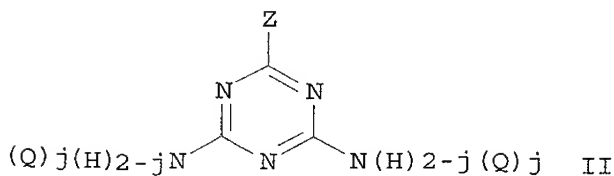
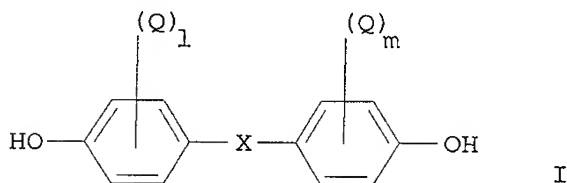
2003:586932 Document No. 139:142011 Heat-resistant inflammable adhesive compositions for flexible printed circuit boards. Mihara, Toshiyuki; Fujikawa, Tomohiro; Shimizu, Takayuki (Tokai Rubber Industries, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003218517 A2 20030731, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-9019 20020117.

AB The title comps. contain (A) polyimide-siloxanes, (B) epoxy resins, (C) compds. which contain, in single mols., .gtoreq.1 triazine groups and .gtoreq.1 9,10-dihydro-9-oxa-10-phosphaphenanthren-10-oxy groups, and (D) hardening agents. Flexible printed circuit boards using the comps. have high inflammability.

L16 ANSWER 2 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN

2003:274797 Document No. 138:288481 Phosphorus-containing fire-resistant curing agents and epoxy resins; advanced epoxy resins, and cured epoxy resins containing them. Wang, Chun Shan; Hsieh, Cheng Yueh; Lin, Ching Yuan (Taiwan). Jpn. Kokai Tokkyo Koho JP 2003105058 A2 20030409, 29 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-386377 20011219. PRIORITY: TW 2001-90123251 20010920.

GI

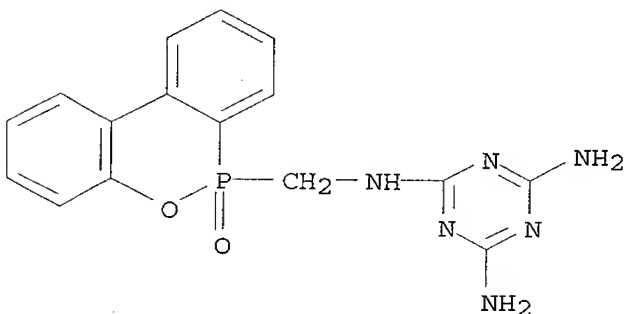


AB The curing agents are selected from I, $\text{NH}_2\text{-iQ}_i\text{C}_6\text{H}_4\text{-p-XC}_6\text{H}_4\text{-p-NH}_2\text{-jQ}_j$, triazine derivs. II, $\text{N.tplbond.CN:C(NH}_2\text{-jQ}_j\text{)NH}_2\text{-iQ}_i$, $\text{Q}'\text{C(NH}_2\text{)2NHC(Q') :NH}$, $\text{H}_2\text{NC(:NH)NHC(Q') :NH}$, and N.tplbond.CNH1-

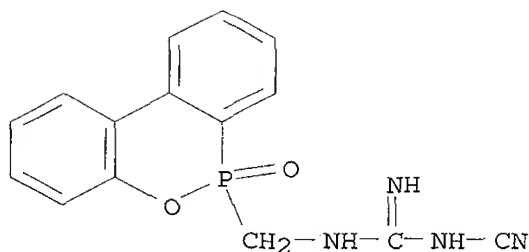
$kQ'kC(:NQ')NH_2-iQ'i$ [1, m, i, j = 0-2; $l + m > 0$; $0 < i + j < 4$; $k = 0-1$; $i + k < 3$; Z = NH_2 , Me, Ph; X = direct link, CH_2 , CMe_2 , cyclohexylidene, O, S, SO_2 ; Q = $Q'CR_1R_2$, Q' ; $Q' = 6\text{-oxido-6H-dibenz}[c,e][1,2]\text{oxaphosphorin-6-yl}$, $Ar_2P(O)$; $R_1, R_2 = H$, C1-18 alkyl, C6-18 (un)substituted aryl, C6-18 (un)substituted arylmethylene; Ar = C1-4 alkyl- or C6-18 aryl-(un)substituted Ph or phenoxy]. Epoxy resins contg. the curing agents are useful for semiconductor device packaging. Thus, bisphenol A was reacted with equimolar (6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methanol in the presence of AcOK to give [(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]bisphenol A, 228 g of which was treated with 564 g bisphenol A diglycidyl ether at 160.degree. for 2 h in the presence of $EtPPh_3Cl$ to give an epoxy resin. The epoxy resin was cured with a novolak to show 5% wt. loss temp. 387.degree. in air and N and good fire resistance.

IT 66499-31-8P 507264-72-4P 507264-74-6P
507264-75-7P

(phosphorus-contg. fire-resistant curing agents for epoxy resins)
RN 66499-31-8 ZCAPLUS
CN 1,3,5-Triazine-2,4,6-triamine, N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]- (9CI) (CA INDEX NAME)

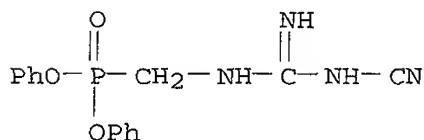


RN 507264-72-4 ZCAPLUS
CN Guanidine, N-cyano-N'-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]- (9CI) (CA INDEX NAME)



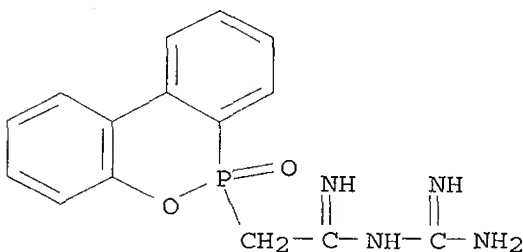
RN 507264-74-6 ZCAPLUS

CN Phosphonic acid, [[[(cyanoamino)iminomethyl]aminomethyl]-, diphenyl ester (9CI) (CA INDEX NAME)



RN 507264-75-7 ZCAPLUS

CN 6H-Dibenz[c,e][1,2]oxaphosphorin-6-ethanimidamide, N-(aminoiminomethyl)-, 6-oxide (9CI) (CA INDEX NAME)



IT 66499-31-8P 507264-72-4P 507264-74-6P

507264-75-7P

(phosphorus-contg. fire-resistant curing agents for epoxy resins)

L16 ANSWER 3 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN

2002:747794 Document No. 137:264082 Phosphorus-and nitrogen-modified epoxy resins, prepreps and laminates therewith. Ikemoto, Kenichi (Sanko Co., Inc., Japan). Jpn. Kokai Tokkyo Koho JP 2002284850 A2 20021003, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-87863 20010326.

AB The fire-retardant epoxy resins are derived by reacting epoxy resins with arom. phosphinyl-contg. triazines. Heating 2,4-bis[[6H-dibenzo[c,e][1,2]oxaphosphorin-6-yl)methylamino]-6-phenyl-1,3,5-triazine P,P'-dioxide 100, Epikote 828 380, dicyandiamide 19, and benzyldimethylamine 0.9 g at 150.degree. for 1 h and hot pressing the resulting liq. in between two iron spacers at 170.degree. and 30 kg/cm² for 70 min gave a cured resin contg. 2% P and 1.9% N and exhibiting UL 94 rating V-0.

IT 461685-60-9P 461685-61-0P 461685-62-1P
461689-82-7P

(phosphorus-and nitrogen-modified fire-retardant epoxy resin, prepreps and laminates therewith)

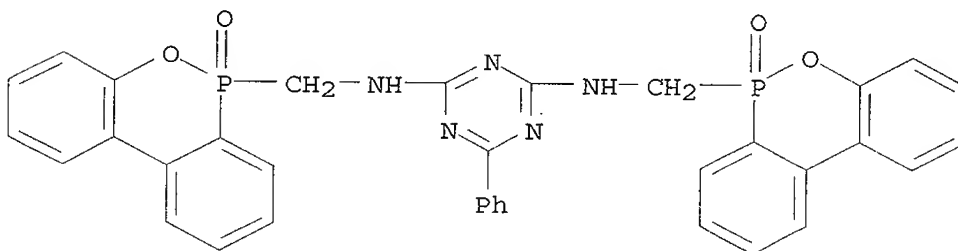
RN 461685-60-9 ZCAPLUS

CN Guanidine, cyano-, polymer with N,N'-bis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl-1,3,5-triazine-2,4-diamine, (chloromethyl)oxirane and 4,4'-(1-methylethylidene)bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 66499-37-4

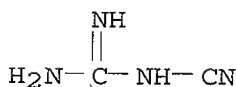
CMF C35 H27 N5 O4 P2



CM 2

CRN 461-58-5

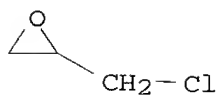
CMF C2 H4 N4



CM 3

CRN 106-89-8

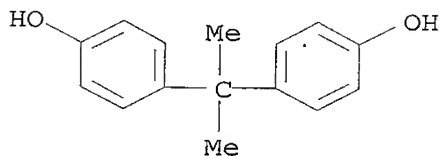
CMF C3 H5 Cl O



CM 4

CRN 80-05-7

CMF C15 H16 O2



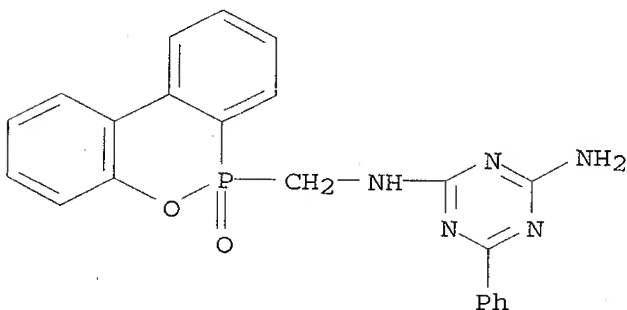
RN 461685-61-0 ZCAPLUS

CN Guanidine, cyano-, polymer with (chloromethyl)oxirane, 4,4'-(1-methylethylidene)bis[phenol] and N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl-1,3,5-triazine-2,4-diamine (9CI) (CA INDEX NAME)

CM 1

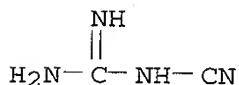
CRN 66560-05-2

CMF C22 H18 N5 O2 P

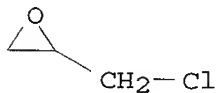


CM 2

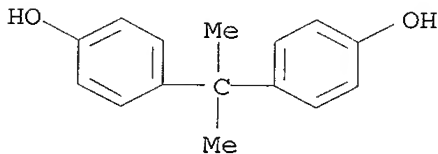
CRN 461-58-5
CMF C2 H4 N4



CM 3
CRN 106-89-8
CMF C3 H5 Cl O

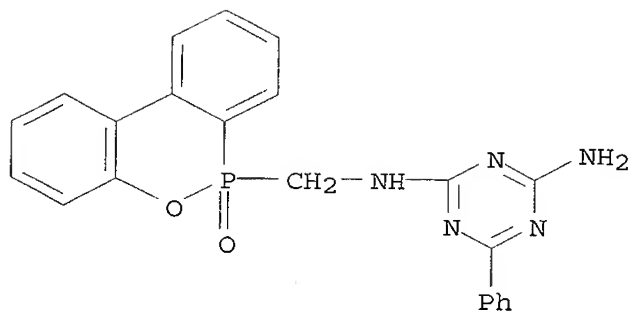


CM 4
CRN 80-05-7
CMF C15 H16 O2



RN 461685-62-1 ZCAPLUS
CN Guanidine, cyano-, polymer with N,N'-bis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl-1,3,5-triazine-2,4-diamine, (chloromethyl)oxirane, 4,4'-(1-methylethylidene)bis[phenol] and N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl-1,3,5-triazine-2,4-diamine (9CI) (CA INDEX NAME)

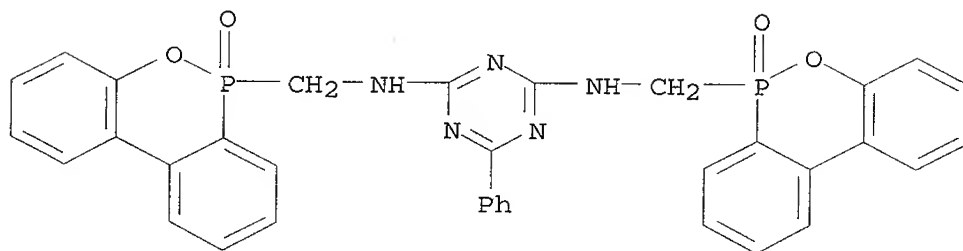
CM 1
CRN 66560-05-2
CMF C22 H18 N5 O2 P



CM 2

CRN 66499-37-4

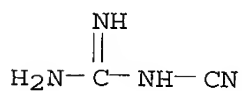
CMF C35 H27 N5 O4 P2



CM 3

CRN 461-58-5

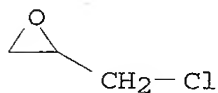
CMF C2 H4 N4



CM 4

CRN 106-89-8

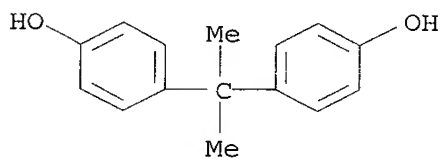
CMF C3 H5 Cl O



CM 5

CRN 80-05-7

CMF C15 H16 O2



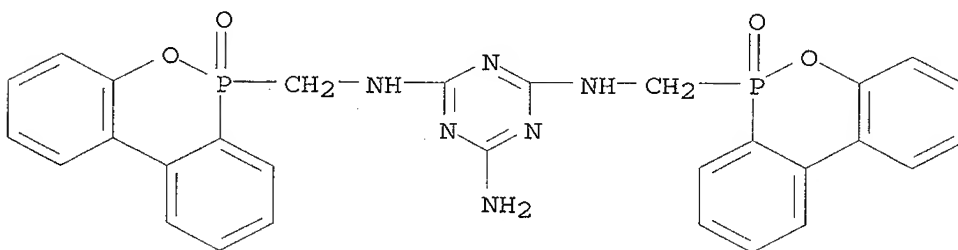
RN 461689-82-7 ZCAPLUS

CN Guanidine, cyano-, polymer with N,N'-bis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-1,3,5-triazine-2,4,6-triamine, (chloromethyl)oxirane and 4,4'-(1-methylethylidene)bis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 66499-40-9

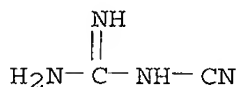
CMF C29 H24 N6 O4 P2



CM 2

CRN 461-58-5

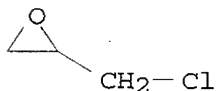
CMF C2 H4 N4



CM 3

CRN 106-89-8

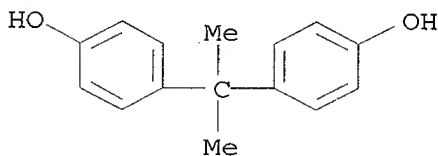
CMF C3 H5 Cl O



CM 4

CRN 80-05-7

CMF C15 H16 O2



IT 461685-60-9P 461685-61-0P 461685-62-1P
461689-82-7P

(phosphorus-and nitrogen-modified fire-retardant epoxy resin,
prepregs and laminates therewith)

L16 ANSWER 4 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
1999:510838 Document No. 131:295097 Cardiosselective Antiischemic
ATP-Sensitive Potassium Channel (KATP) Openers. 6. Effect of
Modifications at C6 of Benzopyranyl Cyanoguanidines. Ding, Charles
Z.; Rovnyak, George C.; Misra, Raj N.; Grover, Gary J.; Miller,
Arthur V.; Ahmed, Syed Z.; Kelly, Yolanda; Normandin, Diane E.;
Sleph, Paul G.; Atwal, Karnail S. (The Bristol-Myers Squibb
Pharmaceutical Research Institute, Princeton, NJ, 08543-4000, USA).
Journal of Medicinal Chemistry, 42(18), 3711-3717 (English) 1999.
CODEN: JMCMAR. ISSN: 0022-2623. Publisher: American Chemical
Society.

AB The effect on potency and selectivity of modifications at the C6
position of the cardioprotective KATP opener BMS-180448 is

described. Structure-activity studies show that a variety of electron-withdrawing groups (ketone, sulfone, sulfonamide, etc.) are tolerated for cardioprotective activity as measured by EC25 values for an increase in time to the onset of contracture in globally ischemic rat hearts. Changes made to the sulfonamido substituent indicate that compds. derived from secondary lipophilic amines are preferred for good cardioprotective potency and selectivity. The diisobutylsulfonamide analog (I) (EC25 = 0.04 μ M) is the most potent compd. of this series. The cardiac selectivity of I results from a combination of reduced vasorelaxant potency and enhanced cardioprotective potency relative to the potent vasodilating KATP openers (e.g., cromakalim). I is over 4 orders of magnitude more cardiac selective than cromakalim. These results support the hypothesis that the cardioprotective and vasorelaxant properties of KATP openers follow distinct structure-activity relationships. The mechanism of action of I appears to involve opening of the cardiac KATP as its cardioprotective effects are abolished by the KATP blocker glyburide.

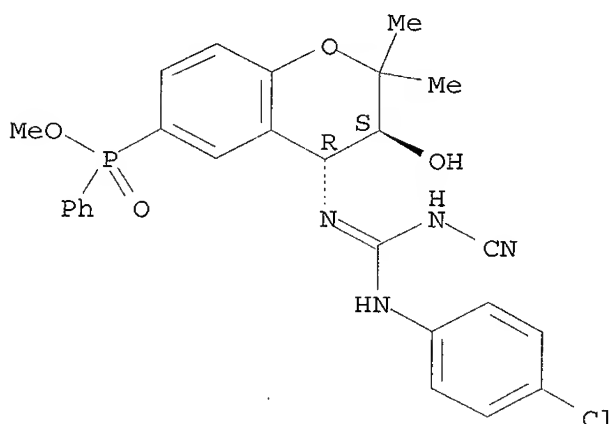
IT 189101-10-8P

(prepn. and cardioprotective structure-activity relations of benzopyranylcyanoguanidines as ATP-sensitive potassium channel openers)

RN 189101-10-8 ZCAPLUS

CN Phosphinic acid, [(3S,4R)-4-[[[(4-chlorophenyl)amino] (cyanoamino)methyl]amino]-3,4-dihydro-3-hydroxy-2,2-dimethyl-2H-1-benzopyran-6-yl]phenyl-, methyl ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.

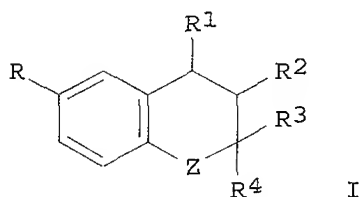


IT 189101-10-8P

(prepn. and cardioprotective structure-activity relations of benzopyranylcyanoguanidines as ATP-sensitive potassium channel openers)

L16 ANSWER 5 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
 1997:208207 Document No. 126:293264 Preparation of
 benzopyranyolphosphinates as calcium channel activators. Misra, Raj
 N. (Bristol-Myers Squibb Company, USA). U.S. US 5612323 A
 19970318, 10 pp. (English). CODEN: USXXAM. APPLICATION: US
 1995-479324 19950607.

GI



AB Title compds. [I; R = P(O)(OR₅)R₆; R₁ = e.g., NR₉C(:X)NR₇R₈; R₂ = H, OH, O₂CH, alkanoyloxy, aroyloxy, etc.; R₃, R₄ = H, alkyl, arylalkyl; R₃R₄ = atoms to form a carbocyclic ring; R₅ = H, alkyl, aryl; R₆ = alkyl or aryl(alkyl); R₇ = aryl(alkyl) or heterocyclyl(alkyl); R₈ = H or alkyl; R₉ = H, alk(en)yl, aryl(alkyl), etc.; X = O, S, NCN; Z = bond, CH₂, CO, O, S, (alkyl)imino, etc.] were prepd. as calcium channel activators (no data). Thus, HC.tplbond.CCMe₂Cl was cyclocondensed with 4-IC₆H₄OH and the product phosphinylated by PhP(O)(OMe)OH to give, after chiral epoxidn., (3S-cis)-I [R = P(O)(OMe)Ph, R₃ = R₄ = Me, Z = O] (II; R₁R₂ = O) which was aminated and the product condensed with 4-ClC₆H₄NHCSNH₂ (prepn. given) to give (3S-trans)-II [R₁ = NHC(:NCN)NHC₆H₄Cl-4, R₂ = OH].

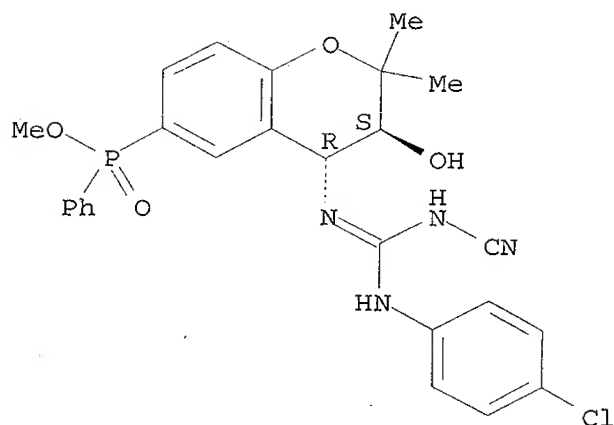
IT 189101-10-8P 189101-14-2P

(prepn. of benzopyranyolphosphinates as calcium channel activators)

RN 189101-10-8 ZCAPLUS

CN Phosphinic acid, [(3S,4R)-4-[[[(4-chlorophenyl)amino](cyanoamino)met
 hylene]amino]-3,4-dihydro-3-hydroxy-2,2-dimethyl-2H-1-benzopyran-6-
 yl]phenyl-, methyl ester (9CI) (CA INDEX NAME)

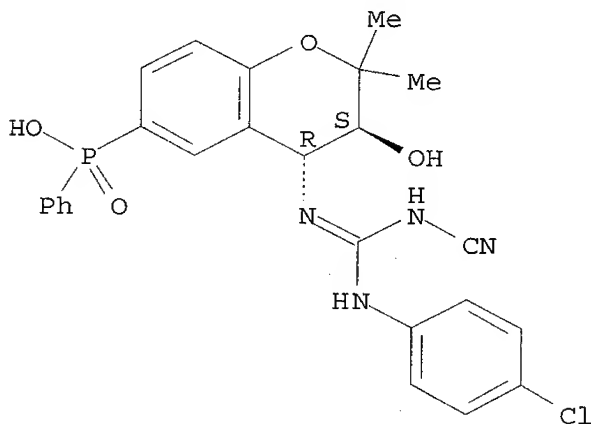
Absolute stereochemistry.



RN 189101-14-2 ZCAPLUS

CN Phosphinic acid, [4-[[[(4-chlorophenyl)amino] (cyanoamino)methylene]amino]-3,4-dihydro-3-hydroxy-2,2-dimethyl-2H-1-benzopyran-6-yl]phenyl-, monolithium salt, (3S-trans)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



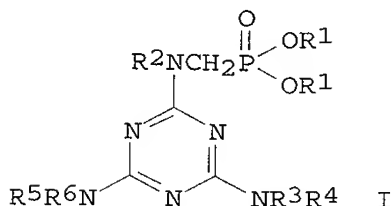
● Li

IT 189101-10-8P 189101-14-2P

(prepn. of benzopyranylphosphinates as calcium channel activators)

L16 ANSWER 6 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
1991:449981 Document No. 115:49981 Preparation of
phosphonomethylmelamines as flame retardants and crosslinking
agents. Arndt, Uwe; Block, Hans Dieter; Schulz-Schlitte, Wolfgang
Hans (Bayer A.-G., Germany). Ger. Offen. DE 3933546 A1 19910411, 4
pp. (German). CODEN: GWXXBX. APPLICATION: DE 1989-3933546
19891007.

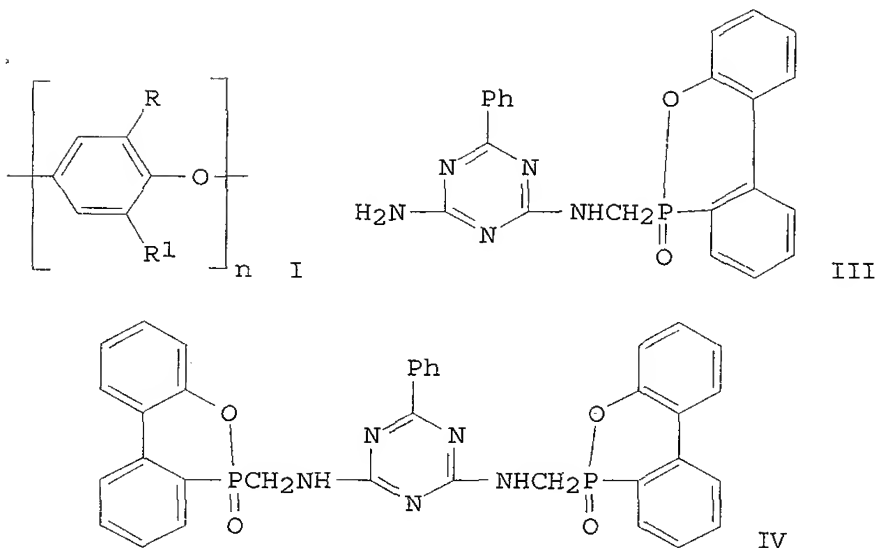
GI



AB Title compds. [I; R^1 = aryl; R^2 - R^6 = H, $CH_2P(O)(OR^1)_2$, (substituted) alkyl, aryl], were prepd. as flame retardants and crosslinking agents (no details). Thus, a mixt. of melamine, $(PhO)_3P$, and paraformaldehyde were stirred at 140-150.degree. followed by distn. of volatiles at 150.degree. and 2 mbar to give 96.8% N-(diphenoxyphosphonomethyl)melamine.

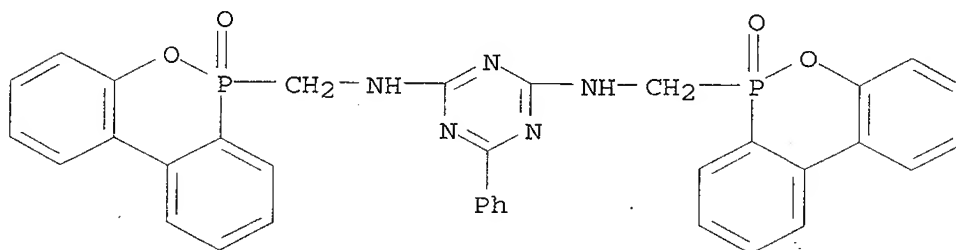
L16 ANSWER 7 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
1983:35522 Document No. 98:35522 Fireproofing and stabilization of poly(phenylene ethers). (Asahi-Dow Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 57105435 A2 19820630 Showa, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1980-179718 19801220.

GI



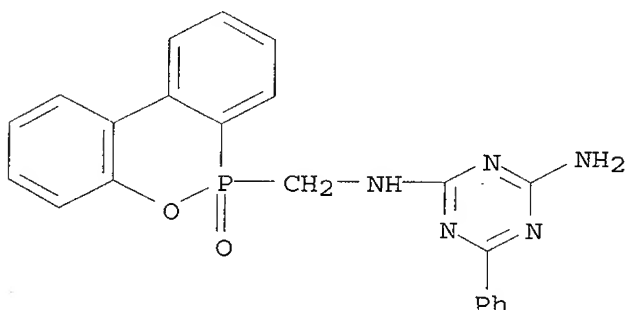
- AB Resin mixts. (85-96%) of poly(phenylene ethers) (I; R, R1 = C1-4 alkyl except tert-Bu) 20-80, rubbery polymers 0-10, and styrene polymers 20-80% are treated with (1) phosphonites 0.1-6, (2) benzoguanamine-dibenzoxaphosphorin oxide adducts, arylphosphonates, or triarylphosphine oxides 0.1-8, (3) cyclic phosphonates 0-2, and (4) triaryl phosphates 0-6%, to give flame-retardant stabilized resin compns. Thus, dry powder of I (R = R1 = Me) [24938-67-8] [intrinsic viscosity 0.67 (30.degree., CHCl3)] 45, rubber-modified (10% polybutadiene rubber) polystyrene [9003-53-6] pellets 50, 6-(2-tert-butylphenoxy)dibenz[c,e][1,2]oxaphosphorin (II) [70135-11-4] 1.0, pentaerythritol tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] 1.0, and 6:94 (by wt.) mixt. of phosphorin oxide (III) [66560-05-2] and bisphosphorin oxide (IV) [66499-37-4] 5 parts were mixed, extruded at 200-270.degree. into a 500-mm vacuum, and pelletized. Molded specimens had Hunter color (E) difference 6.2, self-extinguishing time (UL-94) av. 14.2 (max. 24.3) s, heat-distortion temp. 116.degree., tensile strength 4.38 kg/mm, notched Izod impact strength (23.degree.) 24 kg-cm/cm, elongation 45%, and melt flow index 4 g/10 min, compared with 0, 14.1 (29.0) s, 98.degree., 3.72 kg/mm, 23 kg-cm/cm, 32%, and 6 g/10 min, resp., when II was omitted, and the III-IV mixt. was replaced by tri-Ph phosphate.
- IT 66499-37-4 66560-05-2
(fireproofing agents and heat stabilizers contg., for polyoxyphenylene-polystyrene blends)
- RN 66499-37-4 ZCAPLUS
- CN 1,3,5-Triazine-2,4-diamine, N,N'-bis[(6-oxido-6H-

dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA
INDEX NAME)



RN 66560-05-2 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA
INDEX NAME)



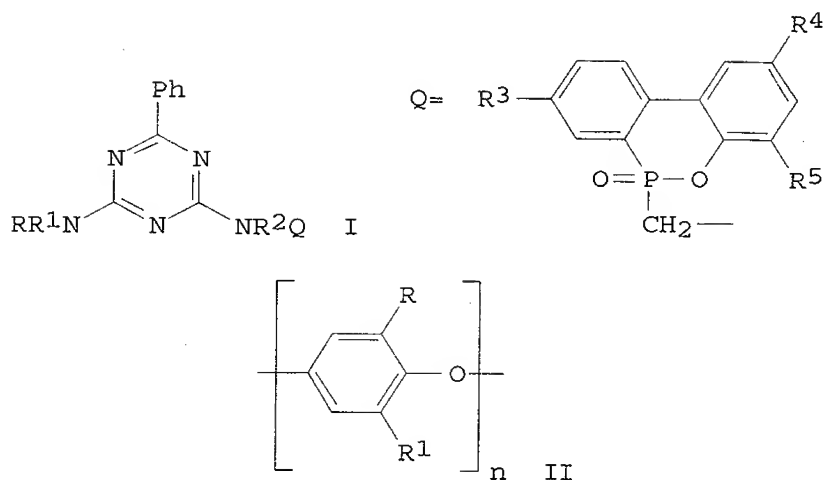
IT 66499-37-4 66560-05-2

(fireproofing agents and heat stabilizers contg., for
polyoxyphenylene-polystyrene blends)

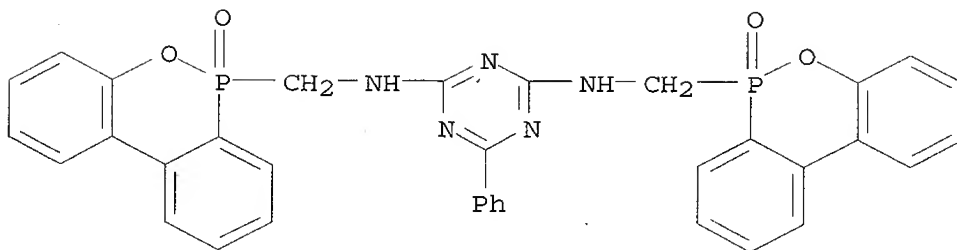
L16 ANSWER 8 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN

1983:17528 Document No. 98:17528 Flame-resistant poly(phenylene ether)
compositions. (Asahi-Dow Ltd., Japan). Jpn. Kokai Tokkyo Koho JP
57105436 A2 19820630 Showa, 7 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1980-179719 19801220.

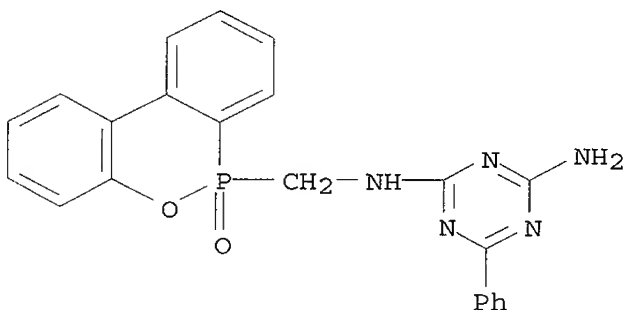
GI



- AB Flame-resistant resin compns. are prep'd. by addn. of 3-15% of a mixt. of I [R-R₂ = H, Q (R₃-R₅ = H, halogen, C₁-8 alkyl, aralkyl, cyclohexyl, Ph)] and a triaryl phosphate to 85-97% of a mixt. of a poly(phenylene ether) having the structure II (R, R₁ = C₁-4 alkyl except tert-Bu) 20-80, rubbery polymers 0-10, and polystyrene 20-80%. Thus, a mixt. of poly(2,6-dimethyl-1,4-phenylene ether) [24938-67-8] (intrinsic viscosity 0.62 dL/g, CHCl₃, 30.degree.) 54, high-impact polystyrene (contg. 9% polybutadiene) 42, tris(3,5-di-tert-butyl-4-hydroxybenzyl)isocyanurate [27676-62-6] 0.75, 6:94 mixt. (III) of I (R-R₅ = H) [66560-05-2] and I (R = Q, R₁-R₅ = H) [66499-37-4] 1, and tris(2,6-dimethylphenyl) phosphate (IV) [121-06-2] 3 parts was melt-compounded, extruded, and pelletized. Testing of the pellets showed self-extinguishing time (grade V-1) av. 12.6 s (max. 27.7 s), heat-distortion temp. 120.degree., tensile strength 5.45 kg/mm², notched Izod impact strength (23.degree.) 25 kg-cm/cm, elongation 32%, and melt flow index 4.3 g/10 min, compared with (V-1) 13.7(28.7) s, 116.degree., 5.32 kg/mm², 25 kg-cm/cm, 32%, and 4.5 g/10 min, resp., when III was replaced by addnl. IV.
- IT 66499-37-4 66560-05-2
(fireproofing agents, for polyoxyphenylene blends with styrene polymers)
- RN 66499-37-4 ZCAPLUS
- CN 1,3,5-Triazine-2,4-diamine, N,N'-bis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)



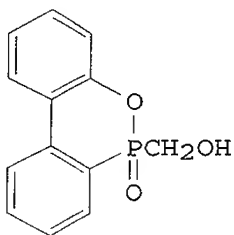
RN 66560-05-2 ZCAPLUS
 CN 1,3,5-Triazine-2,4-diamine, N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)



IT 66499-37-4 66560-05-2
 (fireproofing agents, for polyoxyphenylene blends with styrene polymers)

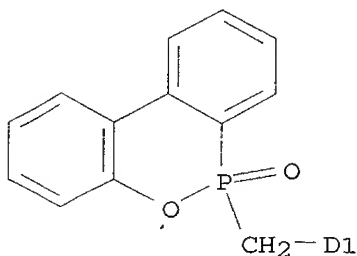
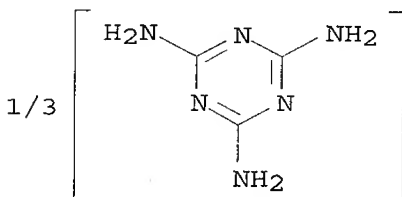
L16 ANSWER 9 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
 1980:164724 Document No. 92:164724 Polyester resin compositions. Yamamoto, Yoshuki; Okasaka, Hidesada; Morikawa, Masanobu (Toray Industries, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 54145754 19791114 Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1978-54734 19780509.

GI



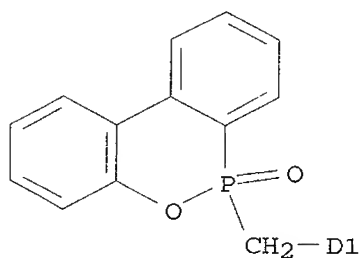
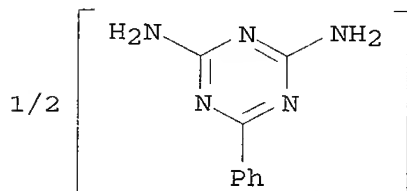
II

- AB Poly(butylene terephthalate) (I) [24968-12-5] or poly(ethylene terephthalate) [25038-59-9] are mixed with condensates of phosphinate (II) with triazinamines or methylstyrene-styrene polymer, and optionally talc, to improve elongation at break and impact resistance. Thus, I contg. 5 phr II-melamine condensate (1:3) [73330-52-6] has breaking elongation 150% and Izod impact strength 3.8 kg-cm/cm, compared with 130 and 3.3, resp., for unmodified I.
- IT 73330-52-6 73330-53-7
(impact modifiers, for polyesters)
- RN 73330-52-6 ZCAPLUS
- CN 1,3,5-Triazine-2,4,6-triamine, tris[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]- (9CI) (CA INDEX NAME)



- RN 73330-53-7 ZCAPLUS
- CN 1,3,5-Triazine-2,4-diamine, bis[(6-oxido-6H-

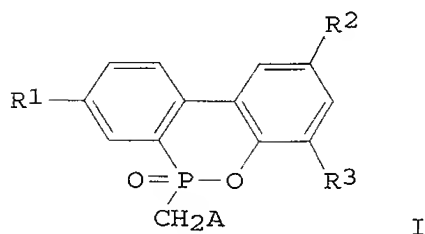
dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA
INDEX NAME)



IT 73330-52-6 73330-53-7
(impact modifiers, for polyesters)

L16 ANSWER 10 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
1978:460523 Document No. 89:60523 Flame-resistant polyoxyphenylene.
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo;
Saito, Toranosuke (Asahi-Dow Ltd., Japan; Sanko Kaihatsu Kagaku
Kenkyusho). Ger. Offen. DE 2730345 19780112, 35 pp. (German).
CODEN: GWXXBX. APPLICATION: DE 1977-2730345 19770705.

GI



AB The title compns., with good processability, contain
polyoxyphenylenes 20-80, styrene polymers 80-20, and the P compds. I

(A = arom. or heterocyclic amine residue; R1-3 = H, halogen, hydrocarbyl) 2-20 parts. Thus, stirring 77 parts I (A = OH, R1-3 = H) [35948-26-6] and 29 parts benzoguanamine [91-76-9] 1 h at 170-230.degree./30 mm and 2 h at 230.degree./30 mm gives N,N(or N')-bis[(6-oxo-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]benzoguanamine (II) [65891-31-8]. A mixt. of poly[oxy(2,6-dimethyl-p-phenylene)] [24938-67-8] (mol. wt. 12,500) 35, ABS [9003-56-9] 65, and II 8 parts has tensile strength 440 kg/cm², Izod impact strength 12.0 kg-cm/cm, heat distortion temp. 88.2.degree., creep (210-kg load, 1000 h, 23.degree.) 0.99%, and ignition time (UL-94) max. 7.5 s and av. 2.8 s.

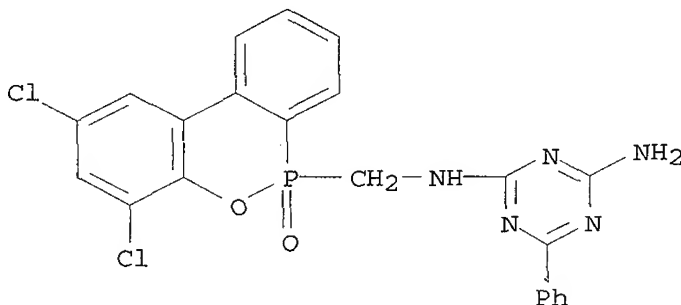
IT 65891-16-9 65891-17-0 65891-18-1
65891-19-2 65891-20-5 65891-31-8
65932-84-5

(fire retardants, for polyoxyphenylene-styrene polymer blends)

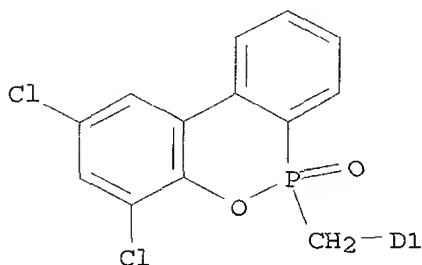
RN 65891-16-9 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N,N(or N,N')-bis[(2,6-dichloro-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

PAGE 1-A



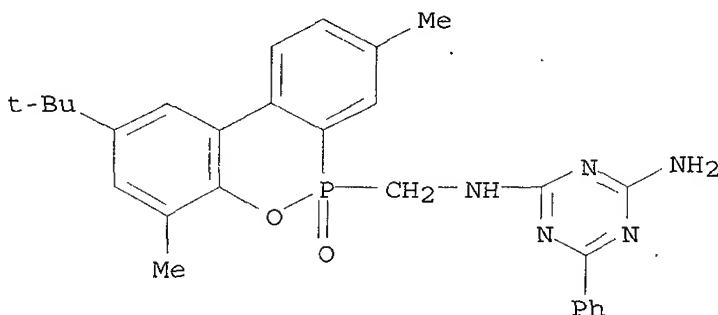
PAGE 2-A



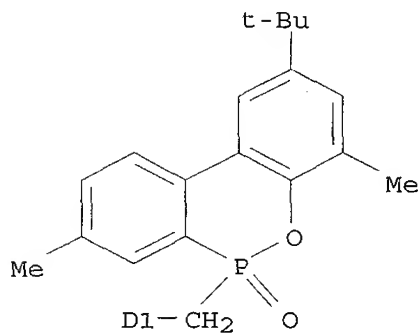
RN 65891-17-0 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N,N(or N,N')-bis[[2-(1,1-dimethylethyl)-4,8-dimethyl-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

PAGE 1-A



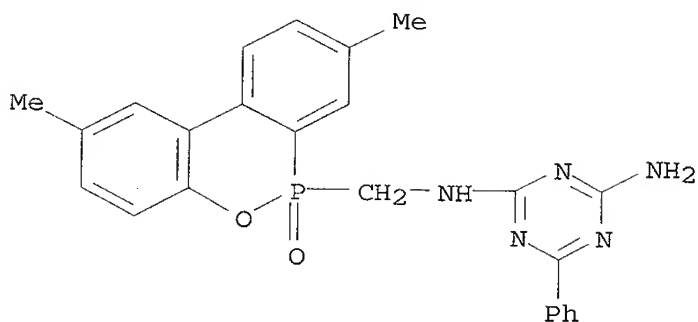
PAGE 2-A



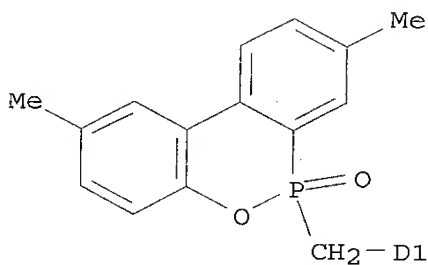
RN 65891-18-1 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N,N(or N,N')-bis[(2,8-dimethyl-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

PAGE 1-A

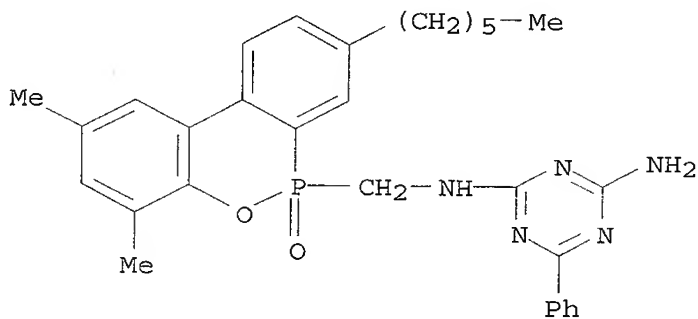


PAGE 2-A

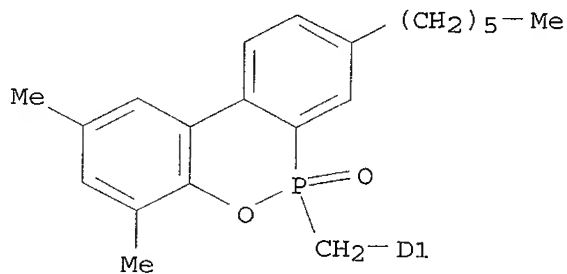


RN 65891-19-2 ZCAPLUS
CN 1,3,5-Triazine-2,4-diamine, N,N(or N,N')-bis[(8-hexyl-2,4-dimethyl-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI)
(CA INDEX NAME)

PAGE 1-A

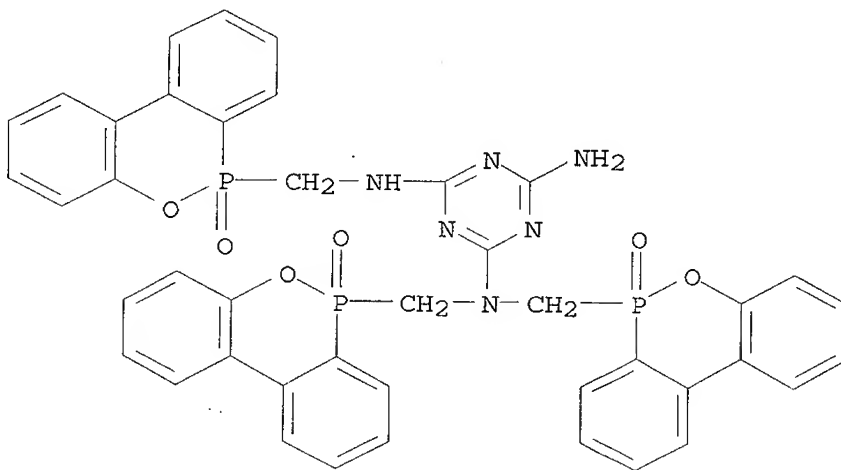


PAGE 2-A

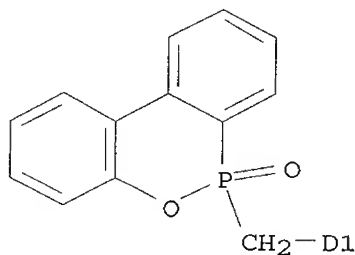


RN 65891-20-5 ZCAPLUS
 CN 1,3,5-Triazine-2,4,6-triamine, tetrakis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl] - (9CI) (CA INDEX NAME)

PAGE 1-A

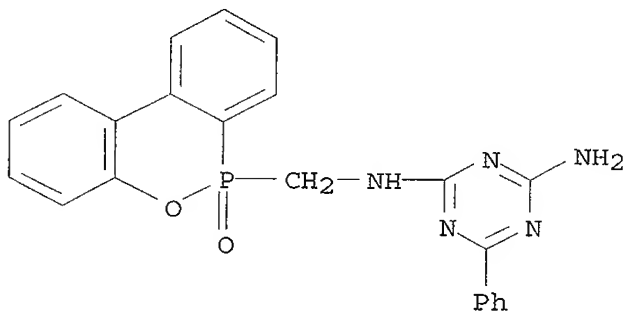


PAGE 2-A

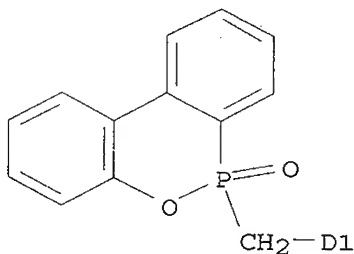


RN 65891-31-8 ZCAPLUS
CN 1,3,5-Triazine-2,4-diamine, N,N(or N,N')-bis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

PAGE 1-A



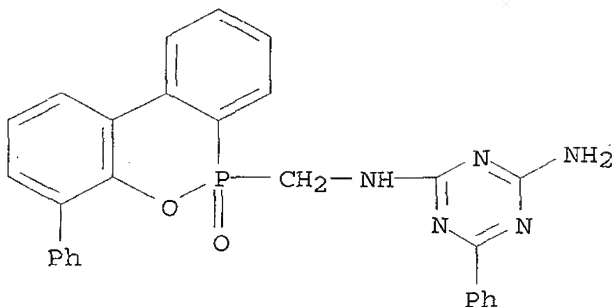
PAGE 2-A



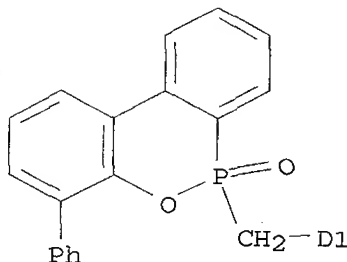
RN 65932-84-5 ZCAPLUS
CN 1,3,5-Triazine-2,4-diamine, N,N(or N,N')-bis[(6-oxido-4-phenyl-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

INDEX NAME)

PAGE 1-A



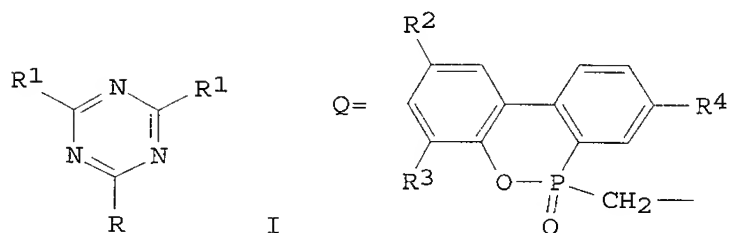
PAGE 2-A



IT 65891-16-9 65891-17-0 65891-18-1
 65891-19-2 65891-20-5 65891-31-8
 65932-84-5
 (fire retardants, for polyoxyphenylene-styrene polymer blends)

L16 ANSWER 11 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
 1978:191050 Document No. 88:191050 Organophosphorus compounds. Saito,
 Toranosuke; Kitani, Masakatsu; Mori, Kenshi; Izawa, Shinichi (Sanko
 Kaihatsu Kagaku Kenkyusho, Japan; Asahi-Dow Ltd.). Ger. Offen. DE
 2730371 19780112, 38 pp. (German). CODEN: GWXXBX. APPLICATION: DE
 1977-2730371 19770705.

GI



AB Approx. 15 title compds. I (R = Ph, NH₂-xQx; R₁ = NH₂-xQx; R₂, R₃, R₄ = H, halo, C1-8 alkyl, aralkyl, cyclohexyl, Ph; X = 0-2), useful as flame retardants for polymers, were prepd. by the condensation of I (R = Ph, NH₂; R₁ = NH₂) with H₂CO, R₅OH (R₅ = Bu, Me), and oxaphosphaphenanthrenes. Thus, 252 g melamine, 515 g formalin, and 2 mL 10% Na₂CO₃ were treated with 962 g BuOH to give tris(butoxymethyl)melamine, which, with 1296 g 9,10-dihydro-9-oxa-10-phosphaphenanthrene 10-oxide, gave I (R = R₁ = NHQ).

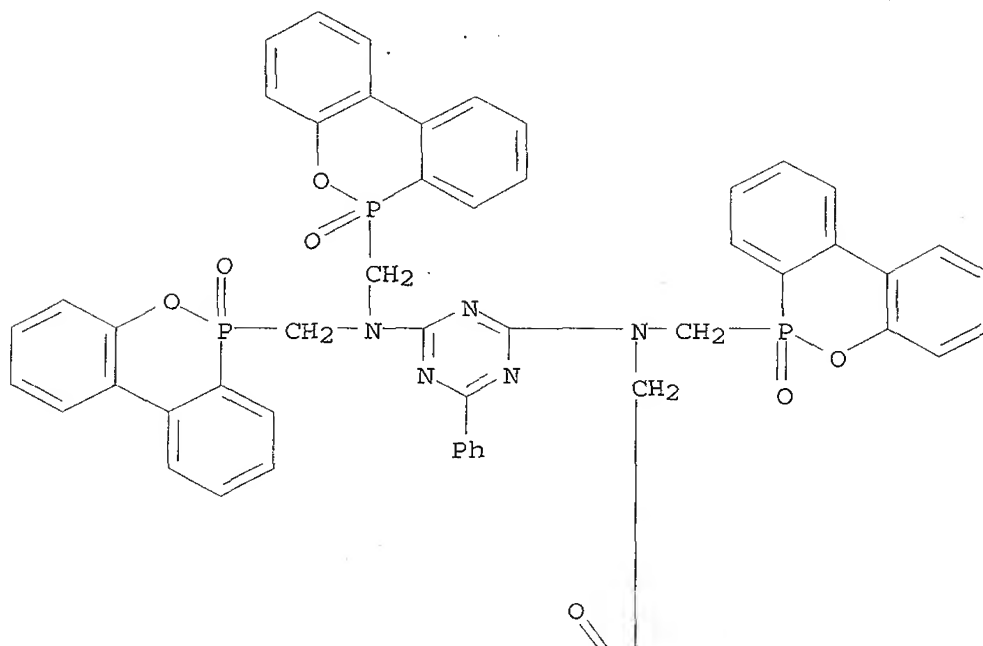
IT 66499-30-7P 66499-31-8P 66499-33-0P
66499-34-1P 66499-35-2P 66499-36-3P
66499-37-4P 66499-39-6P 66499-40-9P
66499-41-0P 66560-05-2P

(prepn. of)

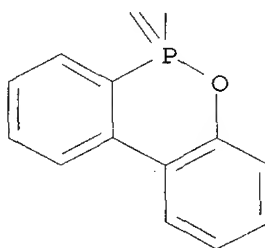
RN 66499-30-7 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N,N,N',N'-tetrakis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

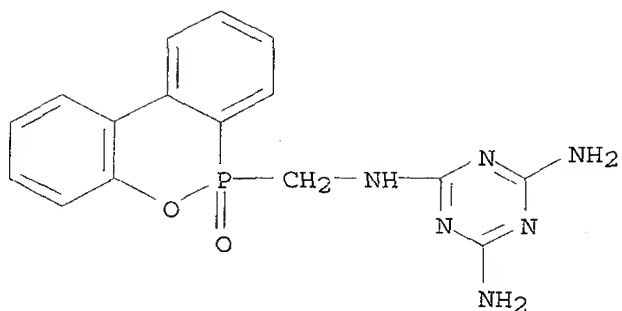
PAGE 1-A



PAGE 2-A

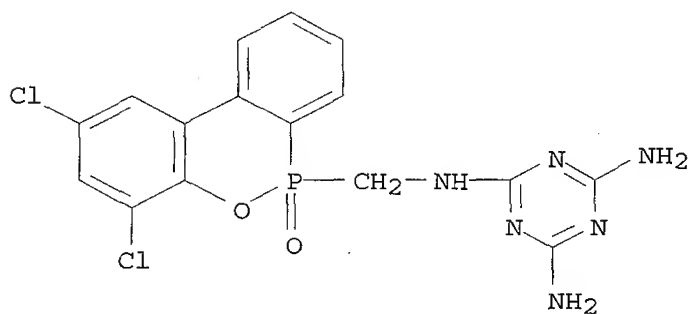


RN 66499-31-8 ZCAPLUS
 CN 1,3,5-Triazine-2,4,6-triamine, N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl] - (9CI) (CA INDEX NAME)



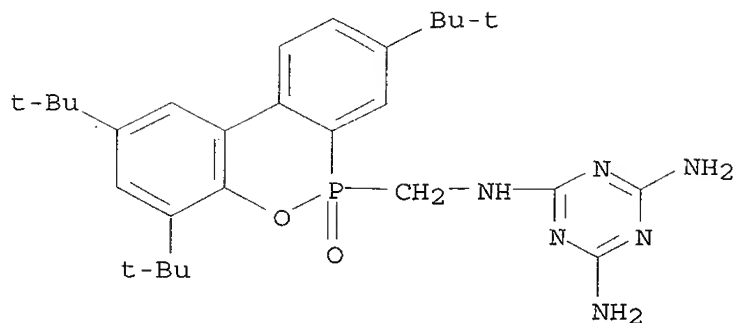
RN 66499-33-0 ZCAPLUS

CN 1,3,5-Triazine-2,4,6-triamine, N-[(2,4-dichloro-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]- (9CI) (CA INDEX NAME)



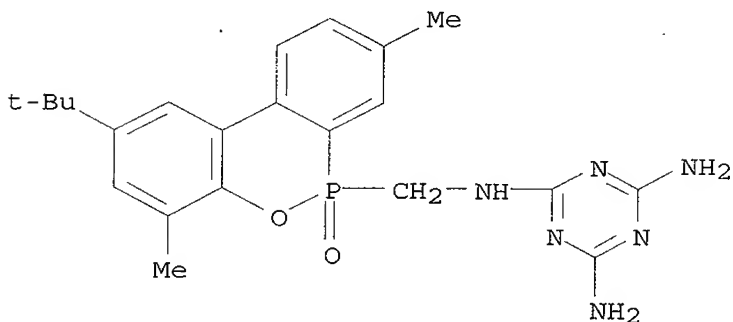
RN 66499-34-1 ZCAPLUS

CN 1,3,5-Triazine-2,4,6-triamine, N-[[2,4,8-tris(1,1-dimethylethyl)-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]- (9CI) (CA INDEX NAME)



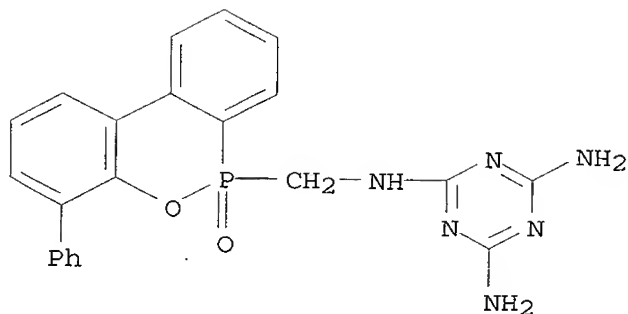
RN 66499-35-2 ZCAPLUS

CN 1,3,5-Triazine-2,4,6-triamine, N-[[2-(1,1-dimethylethyl)-4,8-dimethyl-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl]methyl]-(9CI) (CA INDEX NAME)

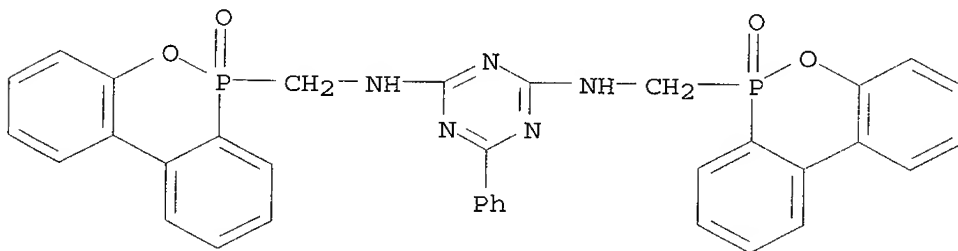


RN 66499-36-3 ZCAPLUS

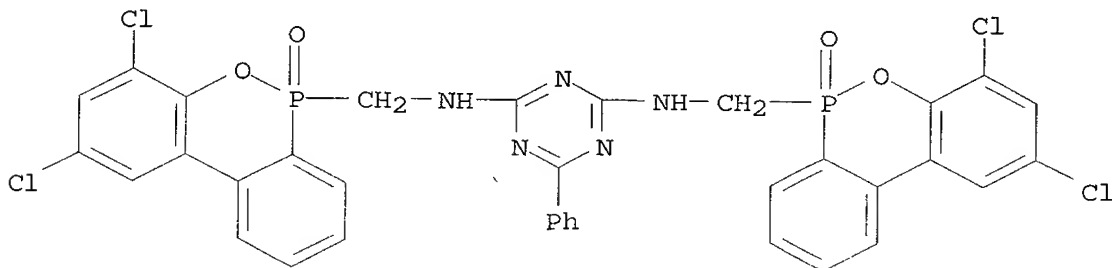
CN 1,3,5-Triazine-2,4,6-triamine, N-[(6-oxido-4-phenyl-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-(9CI) (CA INDEX NAME)



RN 66499-37-4 ZCAPLUS
 CN 1,3,5-Triazine-2,4-diamine, N,N'-bis[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)

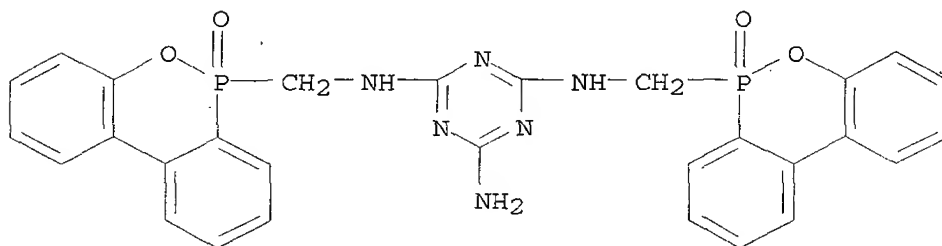


RN 66499-39-6 ZCAPLUS
 CN 1,3,5-Triazine-2,4-diamine, N,N'-bis[(2,4-dichloro-6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)



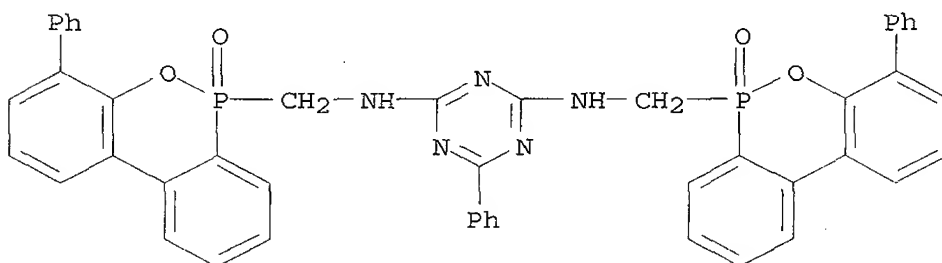
RN 66499-40-9 ZCAPLUS
 CN 1,3,5-Triazine-2,4,6-triamine, N,N'-bis[(6-oxido-6H-

dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]- (9CI) (CA INDEX NAME)



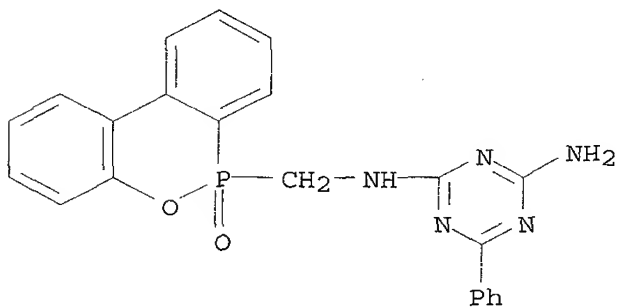
RN 66499-41-0 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N,N'-bis[(6-oxido-4-phenyl-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)



RN 66560-05-2 ZCAPLUS

CN 1,3,5-Triazine-2,4-diamine, N-[(6-oxido-6H-dibenz[c,e][1,2]oxaphosphorin-6-yl)methyl]-6-phenyl- (9CI) (CA INDEX NAME)



IT 66499-30-7P 66499-31-8P 66499-33-0P
 66499-34-1P 66499-35-2P 66499-36-3P
 66499-37-4P 66499-39-6P 66499-40-9P
 66499-41-0P 66560-05-2P
 (prepn. of)

L16 ANSWER 12 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
 1973:124936 Document No. 78:124936 Polymers containing phosphorus.
 XI. Preparation of phosphorus-containing polyamides by
 polycondensation of bis[p-(chloroformyl)phenyl]phenylphosphine oxide
 with heterocyclic diamines. Konya, Sakae; Hirota, Eiichi; Yokoyama,
 Masaaki (Dep. Chem., Kogakuin Univ., Tokyo, Japan). Nippon Kagaku
 Kaishi (11), 2154-7 (Japanese) 1972. CODEN: NKAKB8. ISSN:
 0369-4577.

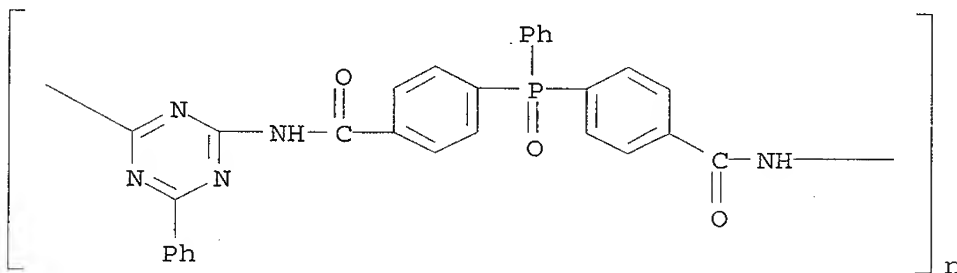
AB Bis[p-(chloroformyl)phenyl]phenylphosphine oxide (I) was
 polycondensed with one of 6 heterocyclic or arom. diamines to give a
 white to slightly yellow P-contg., fire- and heat-resistant
 polyamide with reduced viscosity (25.deg., 0.5 g/dl Me2NAC)
 0.06-0.36 dl/g. Thus, I and N,N'-bis(3-aminophenyl)isophthalamide
 were reacted 4 hr at 0.deg. in Me2NAC with 220 mole % (based on I)
 N,N'-diethylaniline to give 87.5% bis[p-
 (chloroformyl)phenyl]phenylphosphine oxide-N,N'-bis(3-
 aminophenyl)isophthalamide polymer (II) [38641-20-2] with reduced
 viscosity 0.36 dl/g. A film from II was self extinguishing.

IT 41508-06-9P

(prepn. of fire-resistant)

RN 41508-06-9 ZCAPLUS

CN Poly[(6-phenyl-1,3,5-triazine-2,4-diyl)iminocarbonyl-1,4-
 phenylene(phenylphosphinylidene)-1,4-phenylenecarbonylimino] (9CI)
 (CA INDEX NAME)



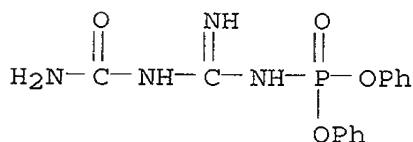
IT 41508-06-9P

(prepn. of fire-resistant)

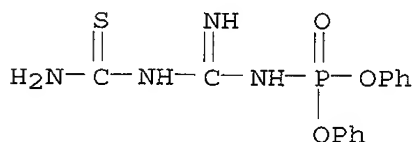
L16 ANSWER 13 OF 13 ZCAPLUS COPYRIGHT 2003 ACS on STN
 1963:408623 Document No. 59:8623 Original Reference No.
 59:1508g-h,1509a Acylation of dicyanodiamide with diaryl
 phosphoryl- and thio-phosphoryl chloride. Beyer, H.; Pyl, T.;
 Lemke, H. (Forschungsabt. VEB Stickstoffwerke, Piesteritz, Germany).

Journal fuer Praktische Chemie (Leipzig), 16(No. 3-4), 132-6
(Unavailable) 1962. CODEN: JPCEAO. ISSN: 0021-8383.

- AB To a soln. of 8.4 g. dicyanodiamide in 50 ml. 4N NaOH and 50 ml. acetone was added, dropwise, a soln. of (PhO)₂P(O)Cl in a little acetone. During the addn., the temp. rose to 50.degree.. The mixt. was kept at 50.degree. for an addnl. 30 min. and then acidified with acetic acid to give 16 g. (60%) (PhO)₂P(O)NHC(:NH)NHCN (I), m. 177.degree.. Similarly were prepd. the p-tolyl analog of I, m. 199.degree., p-chlorophenyl ana-log of I, m. 177.degree., N1-diphenylthiophosphoryl-N3-cyanoguanidine (II), m. 168.degree., p-tolyl analog of II, m. 180.degree., and the p-chlorophenyl analog of II, m. 172.degree.. I was heated with HCl in MeOH to give (PhO)₂P(O)NHC(:NH)NHCONH₂, m. 206.degree.. Similarly, II gave the corresponding thiocarbamoylguanidine, m. 218.degree.. Upon heating I with monoalkylamines, (PhO)₂P(O)NHC(:NH)N-CN.RN+H₃ was obtained (R and m.p.): Et, 155.degree.; Pr, 155.degree.; iso-Pr, 133.degree.; Bu, 159.degree.; iso-Bu, 155.degree..
- IT 93865-74-8, Phosphoramidic acid, (carbamoylamidino)-, diphenyl ester 97196-69-5, Phosphoramidic acid, [(thiocarbamoyl)amidino]-, diphenyl ester (prepn. of)
- RN 93865-74-8 ZCAPLUS
- CN Phosphoramidic acid, (carbamoylamidino)-, diphenyl ester (7CI) (CA INDEX NAME)



- RN 97196-69-5 ZCAPLUS
- CN Phosphoramidic acid, [(thiocarbamoyl)amidino]-, diphenyl ester (7CI) (CA INDEX NAME)



- IT 93865-74-8, Phosphoramidic acid, (carbamoylamidino)-, diphenyl ester 97196-69-5, Phosphoramidic acid, [(thiocarbamoyl)amidino]-, diphenyl ester (prepn. of)